

APR 13 1995

April 12, 1995

Matthew Moran, Site Manager
Sites Management Section
VT DEC - Hazardous Materials Management Division
103 So. Main Street/West Building
Waterbury, Vermont 05671-0404

Re: Site Investigation Report, S.B. Collins' Berlin Mobil Short Stop
SMS Site #94-1690

Dear Matt:

Enclosed is our site investigation report for S.B. Collins' Berlin Mobil Short Stop site in Berlin, Vermont. If possible, I would like to meet with you at the site and discuss our recommendations for further investigation.

Please call me if you have any questions.

Sincerely,

HOFFER & ASSOCIATES

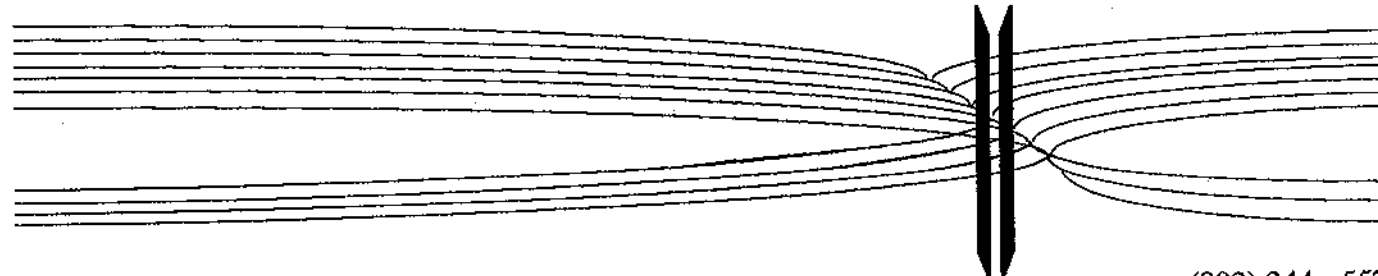


Jefferson P. Hoffer
Principal Hydrogeologist

enc.

cc: Carl Ruprecht, S.B. Collins

Hoffer & Associates
Consulting Hydrogeologists



(802) 244 - 5573
P.O. Box 428, Waterbury, Vermont 05676

REPORT ON UST SITE INVESTIGATION

Berlin Mobil Short Stop
Barre-Montpelier Road
Berlin, Vermont

SMS Site #94-1690

Prepared For:

Carl Ruprecht, UST Manager
S.B. Collins, Inc.
54 Lower Welden Street
St. Albans, Vermont 05478
(802) 527 - 0116

Prepared By:

Hoffer & Associates
Consulting Hydrogeologists
P.O. Box 428
Waterbury, Vermont 05676
(802) 244 - 5573

April 1995

TABLE OF CONTENTS

1.0	SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS.....	1
2.0	BACKGROUND INFORMATION.....	2
2.1	Introduction.....	2
2.2	Site Location and Surrounding Land Uses.....	3
2.3	Physical Setting.....	3
2.4	Water Supplies in the Vicinity.....	4
3.0	SITE INVESTIGATION PROCEDURES.....	5
3.1	PID Soil-Gas Survey.....	5
3.2	Monitoring Well Installations.....	5
3.3	Groundwater Sampling and Analysis.....	6
3.4	PID Measurements.....	7
4.0	RESULTS.....	8
4.1	PID Soil-Gas Survey.....	8
4.2	Monitoring Well Installations.....	8
4.2.1	Stratigraphy.....	8
4.2.2	PID Headspace Readings and Other Observations.....	8
4.3	Groundwater Elevations and Flow Directions.....	9
4.4	Groundwater Sampling Results.....	10
5.0	DISCUSSION OF RESULTS.....	11
5.1	Site Hydrogeology.....	11
5.2	Source, Degree and Extent of Contamination.....	11
5.3	Potential Receptors.....	12
5.4	Recommendations.....	13
	REFERENCES.....	14
APPENDIX A:	Relevant Correspondence	
APPENDIX B:	Monitoring Well Logs	
APPENDIX C:	Chain-of-Custodies, Field Data Sheets & Analytical Reports	

LIST OF FIGURES

- 1** Site location map
- 2** Site vicinity map
- 3** Site map
- 4** Water supply wells within a half-mile radius
- 5** PID soil-gas survey results
- 6** Groundwater elevation contour map, February 14, 1995
- 7** Groundwater elevation contour map, March 7, 1995
- 8** Isoconcentration map for benzene in groundwater, March 7, 1995
- 9** Isoconcentration map for xylenes in groundwater, March 7, 1995
- 10** Isoconcentration map for MTBE in groundwater, March 7, 1995
- 11** West to east cross section

LIST OF TABLES

- 1** Depth to water and groundwater elevations
- 2** PID soil-gas survey data
- 3** Groundwater analytical data
- 4** Groundwater analytical data by sampling point

1.0 SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

A hydrogeologic site investigation was conducted at the Berlin Mobil Short Stop in Berlin, Vermont, in response to evidence of petroleum contamination discovered during the relocation of site USTs in July of 1994. Six groundwater monitoring wells have been installed and sampled at the site. Elevated photoionization detector (PID) readings were observed in soil samples collected during the monitoring well installations. A small amount of floating petroleum product was observed during the development pumping of monitoring well MW-2, although subsequent measurements in this well have not revealed measurable free product.

Site soils include fine-grained sediments, and depth to groundwater at the site is about five feet. Groundwater flows eastward from the site toward Stevens Branch, which is located about 100 feet from the western boundary of the site property.

Groundwater sampling results depict a plume of dissolved-phase gasoline compounds migrating from the site toward Stevens Branch. Contamination present in monitoring wells just upgradient (20 to 40 feet) from Stevens Branch suggest that the plume is discharging into Stevens Branch. Trace levels of contamination were also detected in a culvert which discharges into Stevens Branch. The culvert receives surface water runoff and shallow groundwater from the site. No other potential receptors such as water supplies appear to be threatened by site contamination.

Additional investigation at the site is needed to further evaluate the site hydrogeology, the extent of contamination, and to assess the impacts on Stevens Branch.

2.0 BACKGROUND INFORMATION

2.1 Introduction

This report summarizes an initial site investigation performed at the Berlin Mobil Short Stop in Berlin, Vermont. The site is located along State Route 302, known locally as the Barre-Montpelier Road. As part of site renovations being performed by S.B. Collins, Inc. (SBC), three underground storage tanks (USTs) at the site were excavated in July of 1994. The USTs were relocated on the site to allow the installation of a canopy and new building. The three 12,000 gallon double-walled tanks were originally installed at the site in August of 1989, when the site was owned by Highway Oil, Inc. During UST relocation in July of 1994, the tanks were observed to be in excellent condition, with little sign of weathering. During the site excavation activities, elevated concentrations of organic vapors were detected with a photoionization detector (PID) in soil and shallow groundwater sample headspaces. The highest PID readings were detected beneath fiberglass piping runs exposed near the UST excavation. A water sample collected from shallow groundwater entering the former UST location excavation contained gasoline-related compounds at concentrations exceeding Vermont Groundwater Enforcement standards.

Based on these observations, which were documented in letter reports from Jefferson P. Hoffer, Consulting Hydrogeologists (dated August 2 and 8, 1994), the Vermont Sites Management Section (SMS) requested that a site investigation be performed. A work scope and budget for a site investigation was submitted to and approved by the SMS. Appendix A contains copies of the reports and related correspondence. The original work scope was amended to include the installation of additional groundwater monitoring wells and additional groundwater sampling and analysis. Work performed as part of the site investigation has included the following.

- A PID soil-gas survey
- Initial installation and sampling of four groundwater monitoring wells on site
- Installation and sampling of two more groundwater monitoring wells (off the property)
- An additional round of groundwater sampling

2.2 Site Location and Surrounding Land Uses

Figure 1 presents a site location map, and Figure 2 is a vicinity map. Neighboring properties include a Kentucky Fried Chicken outlet to the north, the Tire Warehouse to the south, and steep undeveloped land to the west. The Barre-Montpelier Road defines the eastern boundary of the site, and the north-flowing Stevens Branch is located immediately west of the road. Coastal Gas, a filling station, is located southeast of the site, across the Barre-Montpelier road.

2.3 Physical Setting

The site is situated on the western edge of the Stevens Branch valley. Topography rises sharply west of the site. Elevation at the site is about 650 feet above mean sea level, about 25 feet higher than the level of Stevens Branch. Stevens Branch flows northward and enters the Winooski River about a mile north of the site. A small stream drains toward the site from the uplands to the west, and its flow is diverted along the northern perimeter of the site in a buried culvert. This culvert, which was installed during site renovations, flows into an existing culvert which flows beneath the Barre-Montpelier road into Stevens Branch. The culvert on the site also receives input from a curtain drain installed along the western boundary of the paved portion of the site (see Figure 3).

The western bank of Stevens Branch near the site has apparently been stabilized with various fill materials, including concrete and granite slabs which are visible on the surface.

According to Stewart's (1971) map of surficial materials of the region, the site is underlain by lacustrine silts and clays. Glacial till is mapped to the west of the site, and recent stream alluvium is mapped along the present channel of Stevens Branch. The Centennial Geologic Map of Vermont (Doll, 1961) indicates that bedrock beneath the site is the Barton River member of the Devonian Waits River formation. The Barton River member includes siliceous limestone and phyllite (Doll, 1961).

2.4 Water Supplies in the Vicinity

Surrounding businesses and residences are served by municipal water and sewer. The Vermont Water Supply Division's water well inventory for Berlin was reviewed to determine if private wells exist near the site. Wells identified within a half-mile radius of the site are presented below and are shown on Figure 4.

Well No.	Owner	Yield (gpm)	Total Depth (ft)	Depth to Rock (ft)	Static Level
6	Fernando Saldi	8	310	130	Flowing
13	Josephine Trombley	40	120	16	20
59	Amcare	60	190	2	Flowing
60	Amcare	60	175	170	Flowing
61	Amcare	65	500	136	Flowing
87	Electrical Wholesale Inc	4	100	30	Flowing
194	Osvaldi Ciampi	50	415	50	90
280	Blue Cross	7	85	0	21
322	H.D. Huntington	20	98	49	unknown
407	Vincent Illuzzi	20	190	49	18
408	Larry Rossi	30	190	38	10
457	Richard Diego	3	300	5	unknown

All of these wells are completed in bedrock. The closest well to the site is well #87, which is owned by Electrical Wholesalers. The well log indicates a 30-foot depth to bedrock and artesian flow. Depth to bedrock for other wells in the Stevens Branch valley (well #'s 6, 87, 407, and 408) range from 30 to 130 feet.

3.0 SITE INVESTIGATION PROCEDURES

3.1 PID Soil-Gas Survey

A PID soil-gas survey was performed on September 19, 1994 to measure relative levels of subsurface contamination. A Photovac MicroTIP HL-2000 (10.6 eV lamp, calibrated to respond to isobutylene) was utilized. Sampling points were located along two north-south traverses in the inferred downgradient direction from the former USTs, piping runs, and former pump island. The past USTs, piping runs, and pump island locations are included on Figure 3. Soil-gas data was collected by manually driving a 3/4-inch, stainless-steel slam bar to a depth of at least two feet. The slam bar was then retracted and replaced with a two foot, stainless-steel sampling tube, which was sealed in the probe hole to prevent atmospheric air from entering. The PID sampling port was connected to the sampling tube, and two PID measurements were recorded for each sampling point. Two measurements were obtained; the maximum reading (which usually occurred in less than one minute), and the reading at one minute. A reading was not taken at one minute if the maximum reading of the instrument was exceeded prior to one minute.

3.2 Monitoring Well Installations

Four groundwater monitoring wells were installed at the site in November of 1994. Drilling services were provided by Adams Engineering of Underhill, Vermont, using "mini-rig" drilling procedures. A hollow barrel sampling tube (2.375-inch diameter by five feet in length) was driven in five-foot increments to a depth of about 15 feet. A new polyethylene sample liner was inserted into the sampler between each run. Soil samples collected from each five-foot run were pulled (or vibrated) from the sample tube and then characterized. Soil samples were characterized for texture, color, moisture, and were also screened with a PID to assess relative levels of contamination.

After drilling to the target depth of 15 feet, the drilling tools were retracted and 1.5-inch diameter PVC wells were inserted into the borehole. Each well was equipped with 10 feet of factory-slotted (0.010 inch) screen, and approximately five feet of solid PVC riser. The wells were positioned so that the screened interval straddled the water table. A commercially-sorted fine sand was placed by gravity into the annular space between the well screen and the borehole. The sandpack extended to a few feet below grade. A

bentonite slurry was placed from the top of the sandpack to the top of the well. The wells were developed by pumping with a peristaltic pump for at least 30 minutes. Well construction details are given on the monitoring well logs, provided in Appendix B.

Off-property monitoring wells MW-5 and MW-6 were sited in the Vermont Agency of Transportation right-of-way. These wells were drilled and installed by Tri-State Drilling & Boring on February 9, 1995, utilizing the ODEX drilling method. Previous attempts to install monitoring wells at this location using hollow-stem augers encountered refusal at depths of four to five feet. The ODEX drilling method was used to drill a six-inch diameter borehole to total depths of 20 feet. Cuttings generated during drilling were collected periodically, or as changes in drilling progress were noted, in order to characterize the stratigraphy and perform PID headspace monitoring.

Two-inch diameter PVC monitoring wells were constructed in the boreholes drilled with the ODEX method. Each well was equipped with 10 feet of factory-slotted (0.010 inch) screen, and approximately ten feet of solid PVC riser. The wells were positioned so that the screened interval straddled the water table. A commercially-sorted sand was placed by gravity into the annular space between the well screen and the borehole. The sandpack extended above the top of the screened interval. Bentonite gravel was placed from the top of the sandpack to a few feet below grade. Protective roadbox covers were placed over the wells. Well construction details are given on the monitoring well logs, provided in Appendix B.

Horizontal and vertical control of the wells was surveyed by Brooks Land Surveying of St. Albans, Vermont. Elevations were obtained for the top of the wells relative to an arbitrary on-site datum of 100.00 feet.

3.3 Groundwater Sampling and Analysis

Three rounds of groundwater sampling were performed at the site. The first set of samples were collected from MW-1, MW-2, MW-3, MW-4, and the culvert discharge on January 17, 1995. Monitoring well samples were collected using dedicated PVC bailers after purging at least one well volume (due to low recharge rates, the wells began to go dry after bailing one well volume). The culvert sample was collected from the culvert where it discharges into Stevens Branch. The culvert sample was collected directly into

sample vials from the culvert discharge. Quality assurance/quality control (QA/QC) samples included a trip blank, a field blank, and a blind duplicate collected from MW-3 and labeled MW-10A on the chain-of-custody.

Monitoring wells MW-5, MW-6, and the culvert were sampled on February 14, 1995. Samples were collected with dedicated polyethylene bailers, and the wells were purged of at least three well volumes prior to sampling. QA/QC samples for this sampling event included a trip blank.

The third sampling event occurred on March 7, 1995. Samples were collected from each of the six monitoring wells, and also from the culvert. A trip blank, field blank, and blind duplicate (collected from MW-6 and labeled MW-10A) were included in this sampling event.

During each sampling episode, the samples were transferred from the bailers (or directly from the culvert discharge) into 40 mL glass vials which contained hydrochloric acid for sample preservation. The samples were labeled and placed into a cooler with ice for transport to the laboratory. The trip blank consisted of two 40-mL vials of deionized water supplied by the laboratory, which were handled with the other samples and returned to the laboratory for analysis. The field blank was obtained at the site at the conclusion of the sampling event by pouring deionized water into two sample vials. Each sampling event was documented on a chain-of-custody and a field sampling data sheet. Copies of each are included in Appendix C.

The samples were analyzed for BTEX and MTBE using EPA Method 8020 by Scitest Laboratory Services of Randolph, Vermont.

3.4 PID Measurements

A photoionization detector (PID) was utilized during the investigation to measure for the presence of organic vapors indicative of petroleum contamination. A Photovac MicroTIP HL-2000 (0.6 eV lamp) was utilized. Prior to each day's usage, the instrument's calibration was checked with an isobutylene standard. The instrument was set to respond to isobutylene. Readings are reported as parts per million, and represent parts per million equivalents to isobutylene.

4.0 RESULTS

4.1 PID Soil-Gas Survey

Table 2 presents PID readings collected during the soil-gas survey. Sampling locations and results are shown on Figure 5. The highest readings were detected east of the former pump island, although elevated readings were also detected east of the former USTs.

4.2 Monitoring Well Installation

4.2.1 Stratigraphy

Descriptions of soil samples collected during the well drilling efforts are included on monitoring well logs in Appendix B. The general stratigraphy at the site included a 2.5 to 4.0 foot layer of sand, silty sand, and fine gravel. This surficial layer, believed to be fill, was underlain by a layer of silt, silty sand, and fine sand. Although this second layer generally contained a high percentage of silt, some lenses of medium sand were also present. A change in stratigraphy was inferred at a depth of 13.4 feet in MW-3, due to drilling refusal, although no sample was retrieved. A hard surface was also encountered at 14.5 feet in MW-4. Soil present in the sampler tip from a depth of 15 feet in MW-4 was dense silty sand with rock fragments, interpreted as glacial till.

Since MW-5 and MW-6 were drilled with the ODEX method, which advances the borehole using air-rotary, no undisturbed samples were collected. The stratigraphy encountered at MW-5 and MW-6, based on examination of the cuttings and observations of drilling progress, can be generalized as follows.

- 0 - 5 feet of silty sand (fill)
- 5 - 7 feet of granite boulders (fill)
- 7- 20 feet of silt and sand, with rock fragments (?)

4.2.2 PID Headspace Readings and Other Observations

Elevated PID headspace readings were observed in three of the boreholes (MW-2,

MW-3, and MW-4). Selected headspace readings for these three boreholes are given below.

MW-2		MW-3		MW-4	
Depth (feet)	PID (ppm)	Depth (feet)	PID (ppm)	Depth (feet)	PID (ppm)
5.5 - 10.5	>2500	1.5 - 5.2	17.0	3.5 - 5.0	60
10.5 - 15.5	1850	9.0 - 10.0	40	5.5-10.5	829
				10.5-12.5	1688

Black staining in soil samples, possibly indicative of petroleum contamination, was detected in samples collected from MW-2 (5.5 - 10.5 and 13.5 - 14.5 feet), MW-3 (10.5 - 12.5 feet), and MW-4 (5.5 - 10.5 feet). A sample of the black-stained soil from MW-2 (5.5 - 10.5 feet) was mixed with water and displayed a sheen. A sheen was also observed in the soil sample collected from 13.5 to 14.5 feet in MW- 2 after following the same procedure.

After installation of MW-2, the well was developed by pumping with a peristaltic pump. The well was pumped for 30 minutes and the discharge was directed into a 5-gallon bucket. The total amount of water pumped from MW-2 after 30 minutes was about 2.5 gallons. A thin layer of petroleum product was observed floating on the water in the bucket. During subsequent site visits, MW-2 has been checked with an interface probe, and measurable free product has not been detected, although sheens have been observed on purge water bailed during sampling events.

The highest PID reading detected in headspace samples of cuttings from MW-5 was 5.2 ppm for a sample from 11 feet. For MW-6, the maximum PID headspace was 2.3 ppm for a sample from 17 feet.

4.3 Groundwater Elevations and Flow Directions

Depth to water measurements collected at the site are compiled on Table 1, which includes calculated groundwater elevations based on the survey data. Groundwater elevation contour maps for February 15 and March 7, 1995, are presented as Figures 6 and 7, respectively. Groundwater flow direction is generally northeastward from the site

toward Stevens Branch. The hydraulic gradient between upgradient well MW-1 and the other on-site wells is 0.10. The gradient becomes more steep (0.20) between the site and the east side of the Barre-Montpelier road.

4.4 Groundwater Sampling Results

Groundwater analytical data is compiled on Table 3, which also includes Vermont Groundwater Enforcement Standards and other regulatory thresholds. Table 4 presents the analytical data by sampling point. Isoconcentration maps for benzene, xylenes, and MTBE are presented on Figures 8, 9, and 10.

The highest BTEX concentrations were detected in MW-2, which is directly downgradient from the former pump island and piping runs. The highest MTBE concentration was detected in MW-4. MTBE and BTEX compounds have also been detected at low concentrations in samples collected from the culvert discharge.

5.0 DISCUSSION OF RESULTS

5.1 Site Hydrogeology

Figure 11 presents a west to east cross section illustrating the site hydrogeology. Soils observed during monitoring well drilling indicate the site is underlain by generally fine-grained sediments including silt, silty sands, and lenses of medium-grained sand. Depth to water in the on-site monitoring wells has ranged from five feet in upgradient well MW-1 to just over 10 feet in MW-4. The hydraulic conductivity of this layer is apparently fairly low, although the lenses of sand may provide isolated avenues for higher flow rates. Monitoring wells MW-1 through MW-4 went dry after bailing just one well volume during the sampling events. Evidence of an underlying glacial till was encountered during drilling of MW-3 and MW-4, at a depth of about 14 feet. If present

Drill cuttings observed during the installation of off-property wells MW-5 and MW-6 included at least 7 feet of fill materials (including granite slabs), underlain by silt and sand. Since no undisturbed samples were collected, it is difficult to interpret the geologic origin or hydraulic characteristics of the sediments encountered during drilling of MW-5 and MW-6. Depth to water in these wells is about 15 feet. During groundwater sampling events, both MW-5 and MW-6 exhibited fairly rapid recovery during bailing. This observation suggests that the stratigraphy in the vicinity of MW-5 and MW-6 is more transmissive than the layer tapped by the monitoring wells on the site property.

Groundwater elevations indicate flow from the site northeastward toward Stevens Branch. The gradient is much steeper between the eastern margin of the site and Stevens Branch.

5.2 Source, Degree, and Extent of Contamination

Groundwater sampling results define a plume of dissolved-phase BTEX and MTBE migrating from the site toward Stevens Branch. Contaminant concentrations exceed Vermont Groundwater Enforcement Standards in all downgradient monitoring wells, both on and off the property. Based on the concentrations of MTBE and BTEX compounds detected in off-property monitoring wells MW-5 and MW-6, which are less than 50 feet from the Stevens Branch, is likely that contaminated groundwater is discharging into Stevens Branch. The lateral extent of groundwater contamination has not been defined.

A petroleum sheen was observed in a soil sample collected from MW-2, and a small amount of free-phase (floating) product was removed from MW-2 during development pumping. No free-product accumulation has been detected in MW-2 during subsequent monitoring events, although sheens have been observed on water bailed from this well. No sheens have been observed in any other wells.

Benzene has been detected in the culvert discharge at concentrations exceeding regulatory standards. The culvert conveys drainage from a small stream on northern perimeter of the site, from a curtain drain on the western edge of the site, and from surface-water runoff at the site.

The exact source of the observed soil and groundwater contamination at the site is uncertain. The present monitoring well network and sampling results depict a hot spot just downgradient (northeast) from the former pump island and piping runs for the USTs excavated in 1994. The highest PID readings detected during the soil-gas survey were generally east of the former pump island and former piping. The highest soil PID readings during the site excavations were found near the fiberglass piping entering the former UST excavation. Releases at the site may have occurred from the piping runs, spillage at the pumps, or other sources.

5.3 Potential Receptors

The buildings in the vicinity of the site are served by municipal water. The nearest drilled well on record with the Water Supply Division is located about 500 feet northwest of the site. The status of this well, which was originally drilled for Electrical Wholesale Inc, is unknown. The log for this well indicates it is completed in bedrock (100 feet total depth, 30 feet to bedrock, and artesian flow). Based on the hydrogeologic setting, as well as groundwater flow directions mapped at the Berlin Mobil site, this well is not likely to be impacted by site contamination.

Site contamination does not appear to pose a threat to air quality, although excavation of utilities along the eastern margin of the site may expose petroleum vapors.

Surface water (Stevens Branch) is being impacted by dissolved-phase contamination originating at the site via two pathways; through natural groundwater flow, and through the drainage culvert.

5.4 Recommendations

Additional investigation is needed to further evaluate the site hydrogeology, the extent of contamination, and to assess the impacts to surface water. Recommendations include the following:

- monthly monitoring/sampling of the six wells and culvert discharge
- one round of sampling Stevens Branch water/sediment
- hydraulic (slug) testing of existing monitoring wells
- obtaining flow records of Stevens Branch
- reviewing State files on nearby site investigations (if present)

Monthly monitoring of the existing monitoring wells and culvert will provide data on contaminant concentration trends and groundwater elevation fluctuations. Sampling of Stevens Branch (water and sediment) will provide information on the impact of site contamination on this receptor. Hydraulic testing of the monitoring wells will provide data on the rates of groundwater flow, which can be used to estimate the mass of contaminants entering Stevens Branch. Information on Stevens Branch flow characteristics can also be used to estimate the effects of site contamination on this receptor (by mass loading estimates).

REFERENCES

Doll, Charles G., 1961, *Centennial Geologic Map of Vermont*, Vermont Geological Survey, State of Vermont.

Stewart, D.P., 1971, *Geology for Environmental Planning in the Barre-Montpelier Region, Vermont*, Vermont Geological Survey, Environmental Geology No. 1.

TABLE 1
 Depth to water and groundwater elevations,
 Berlin Mobil Short Stop, Berlin, Vermont,
 SMS Site # 94-1690.

DEPTH TO WATER (feet)

Well ID	Elev. of Top of Casing	1/17/95 DTW	2/14/95 DTW	3/7/95 DTW
MW-1	105.28	5.03	5.52	5.45
MW-2	100.02	8.45	9.19	8.87
MW-3	100.24	8.28	8.64	8.46
MW-4	99.55	10.24	10.35	9.76
MW-5	94.39		14.94	14.98
MW-6	93.94		14.51	14.68

DTW = depth to water in feet below top of 2" PVC

GROUNDWATER ELEVATIONS (feet)

WELL ID	Elev. of Top of Casing	1/17/95 GW Elev.	2/14/95 GW Elev.	3/7/95 GW Elev.
MW-1	105.28	100.25	99.76	99.83
MW-2	100.02	91.57	90.83	91.15
MW-3	100.24	91.96	91.60	91.78
MW-4	99.55	89.31	89.20	89.79
MW-5	94.39		79.45	79.41
MW-6	93.94		79.43	79.26

GW Elev. = groundwater elevation in feet, relative to on-site benchmark of 100.00 feet

TABLE 2
PID soil-gas survey results,
Berlin Mobil Short Stop, Berlin, Vermont, SMS Site #94-1690.

Results in ppm relative to isobutylene

X (feet)	Y (feet)	Maximum reading (ppm)	1-minute reading (ppm)
0	-20	1410.5	218.5
0	-30	0	0
0	0	142.5	57.5
0	20	14.9	13.3
0	40	>2500	-
0	80	828	501
0	100	3.3	0.4
20	110	100.6	2.8
20	90	>2500	-
20	70	>2500	-
20	30	>2500	-
20	10	2145.6	1075.6
20	-10	8.9	8.9
20	-30	1.5	0

NOTES:

X = East(+)/West(-)

Y = North(+)/South(-)

0,0 = southeast edge of concrete near southeast pump island

PID = MicroTIP HL-2000, set to respond to isobutylene.

> 2500 = greater than the instrument maximum of 2500 ppm

- = no reading taken when >2500 achieved prior to one minute

TABLE 3
Groundwater analytical data, Berlin Mobil Short Stop,
Berlin, Vermont, SMS Site #94-1690.
(results in µg/L)

Samples Collected on January 17, 1995

Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
MW-1	<1	5	<1	<1	<1
MW-2	2110	10100	2880	21500	<200
MW-3	50 / 79	46 / 32	202 / 278	380 / 492	148 / 153
MW-4	1180	604	792	4450	852
Culvert*	2	<1	1	<1	10
Trip Blank	<1	<1	<1	<1	<1
Field Blank	<1	<1	<1	<1	<1

Samples Collected on February 14, 1995

Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
MW-5	387	18	169	355	257
MW-6	13	<1	2	13	273
Culvert*	6	<1	4	7	17
Trip Blank	<1	<1	<1	<1	<1

Samples Collected on March 7, 1995

Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
MW-1	<1	1	<1	<1	<1
MW-2	1790	7200	1640	12900	288
MW-3	<10	38	225	2387	158
MW-4	353	144	213	1176	143
MW-5	208	19	150	354	257
MW-6	17/18	<1 / <1	3 / 2	16/13	284/299
Culvert*	1	<1	<1	1	5
Field Blank	<1	<1	<1	<1	<1
Trip Blank	<1	<1	<1	<1	<1

<1 = less than a detection limit of 1

22 / 22 = sample result and field duplicate result

*Culvert sampled at discharge point into Stevens Branch

REGULATORY THRESHOLDS (ug/L)

Standard	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
VT GES	5	2420	680	400	-
VT PAL	0.5	1210	340	200	-
VHA	1	1000	-	-	40
EPA MCL	5	1000	700	10000	-

VT GES = Vermont Groundwater Enforcement Standard

VT PAL = Vermont Preventive Action Limit

VHA - Vermont Health Advisory

MCL = EPA Maximum Contaminant Level for Drinking Water

TABLE 4

Groundwater analytical data by sampling point, Berlin Mobil Short Stop,
Berlin, Vermont, SMS Site #94-1690 (results in µg/L).

MW-1

Date	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
1/17/95	<1	5	<1	<1	<1
3/7/95	<1	1	<1	<1	<1

MW-2

Date	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
1/17/95	2110	10100	2880	21500	<200
3/7/95	1790	7200	1640	12900	288

MW-3

Date	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
1/17/95	50/79	46/32	202/278	380/492	148/153
3/7/95	<10	38	225	2387	158

MW-4

Date	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
1/17/95	1180	604	792	4450	852
3/7/95	353	144	213	1176	143

MW-5

Date	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
2/14/95	387	18	169	355	257
3/7/95	208	19	150	354	257

MW-6

Date	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
2/14/95	13	<1	2	13	273
3/7/95	17/18	<1 / <1	3 / 2	16 / 13	284 / 299

Culvert

Date	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
1/17/95	2	<1	1	<1	10
2/14/95	6	<1	4	7	17
3/7/95	1	<1	<1	1	5

< 1 = less than a detection limit of 1
87/89 = sample result/duplicate result

REGULATORY THRESHOLDS (ug/L)

Standard	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
VT GES	5	2420	680	400	-
VT PAL	0.5	1210	340	200	-
VHA	1	1000	-	-	40
EPA MCL	5	1000	700	10000	-

VT GES = Vermont Groundwater Enforcement Standard

VT PAL = Vermont Preventive Action Limit

VHA - Vermont Health Advisory

MCL = EPA Maximum Contaminant Level for Drinking Water

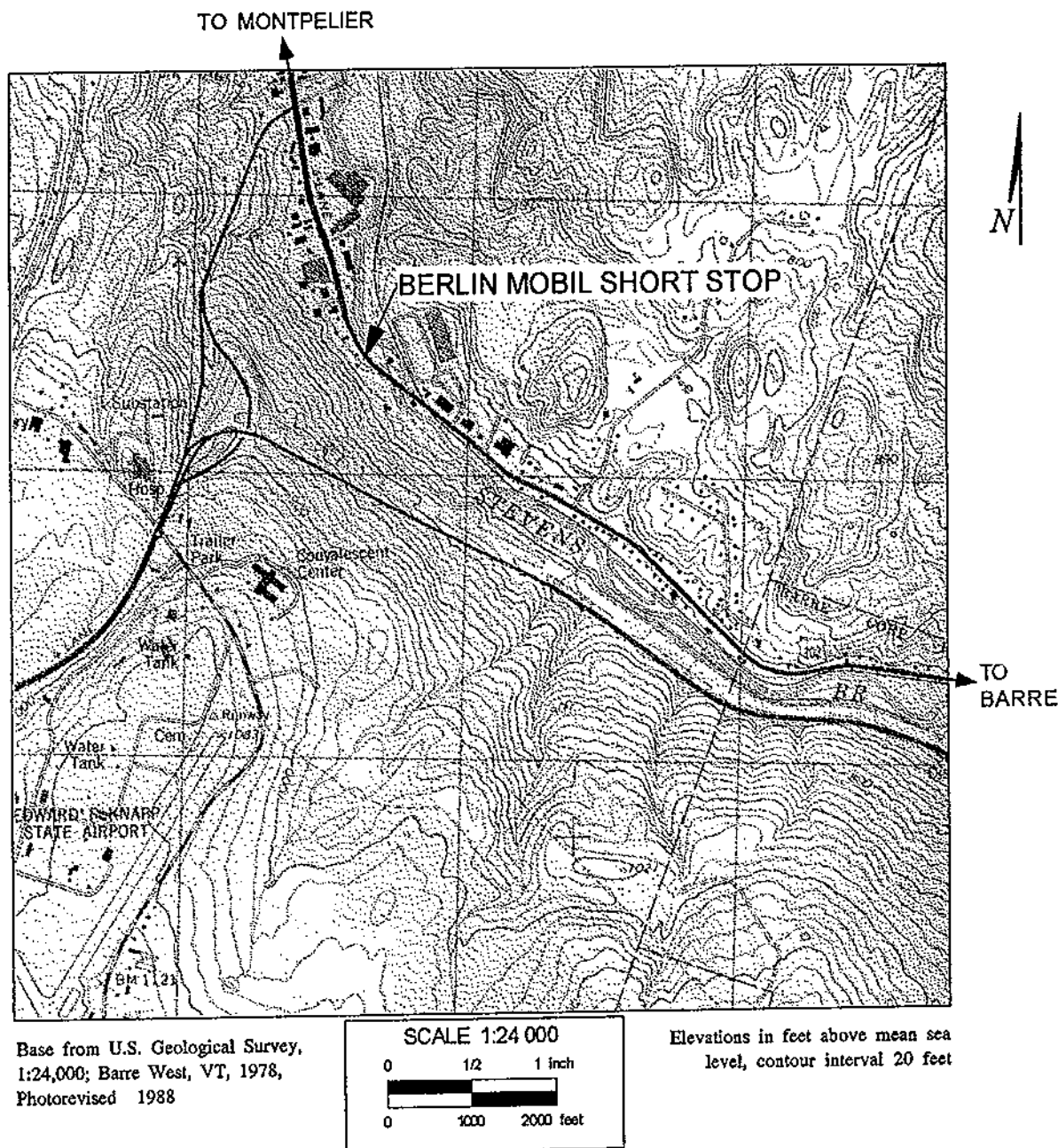
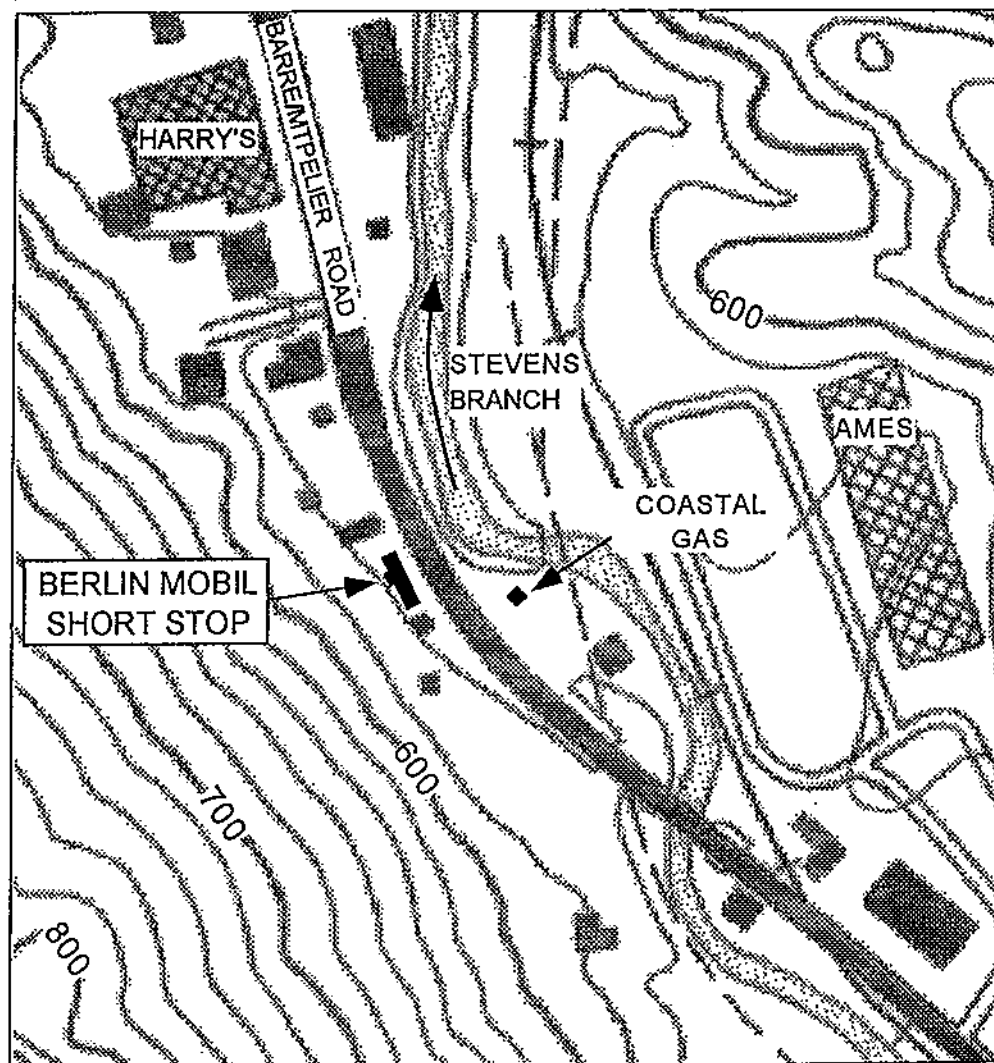
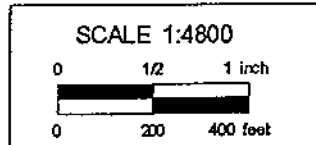


FIGURE 1
Site location map, Berlin Mobil Short Stop,
Barre-Montpelier Road, Berlin, Vermont,
SMS Site # 94-1690.



Base from U.S. Geological Survey,
1:24,000; Barre West, VT, 1978,
Photorevised 1988



Elevations in feet above mean sea
level, contour interval 20 feet

FIGURE 2
Site vicinity map, Berlin Mobil Short Stop,
Barre-Montpelier Road, Berlin, Vermont,
SMS Site #94-1690.

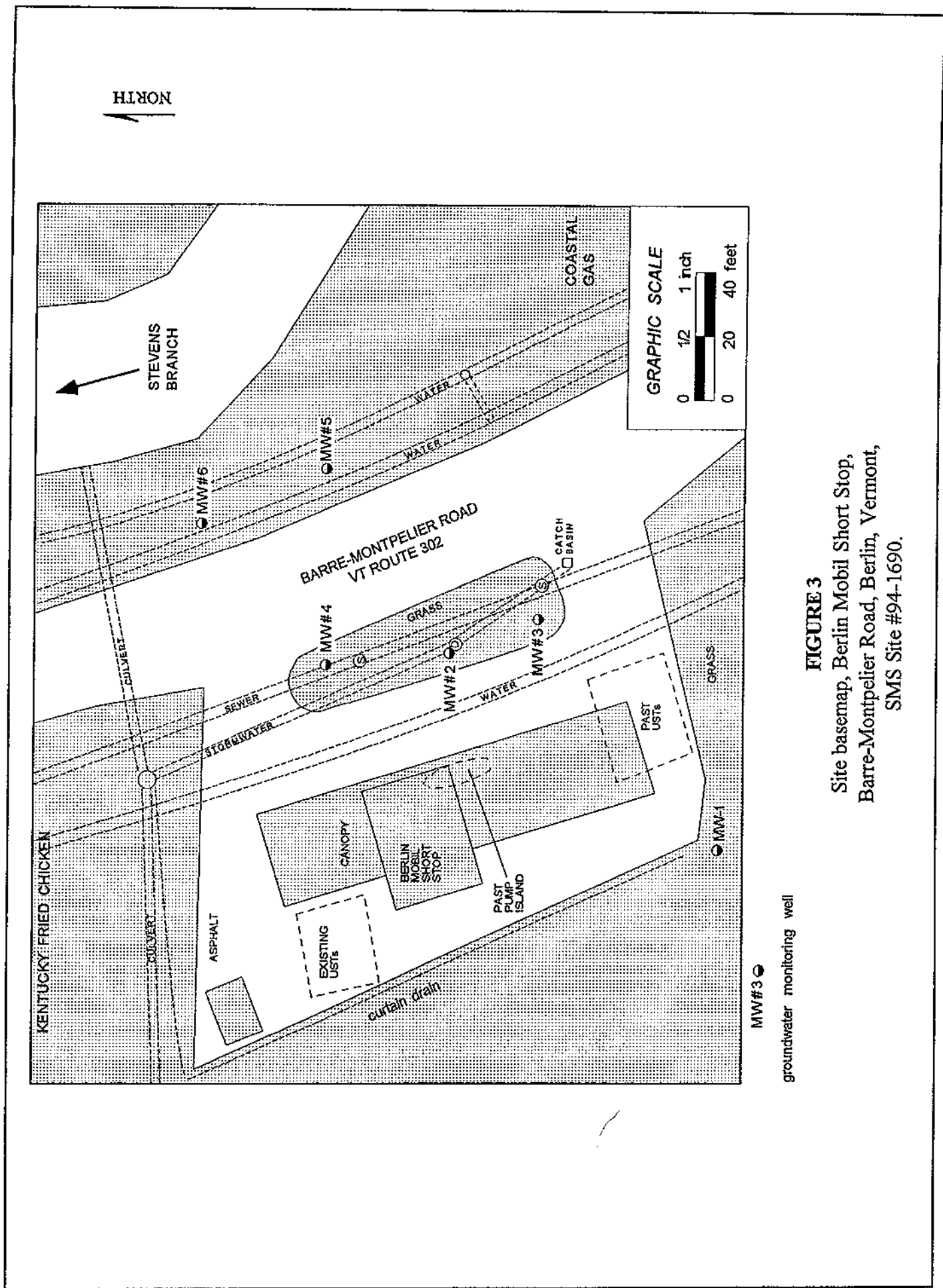
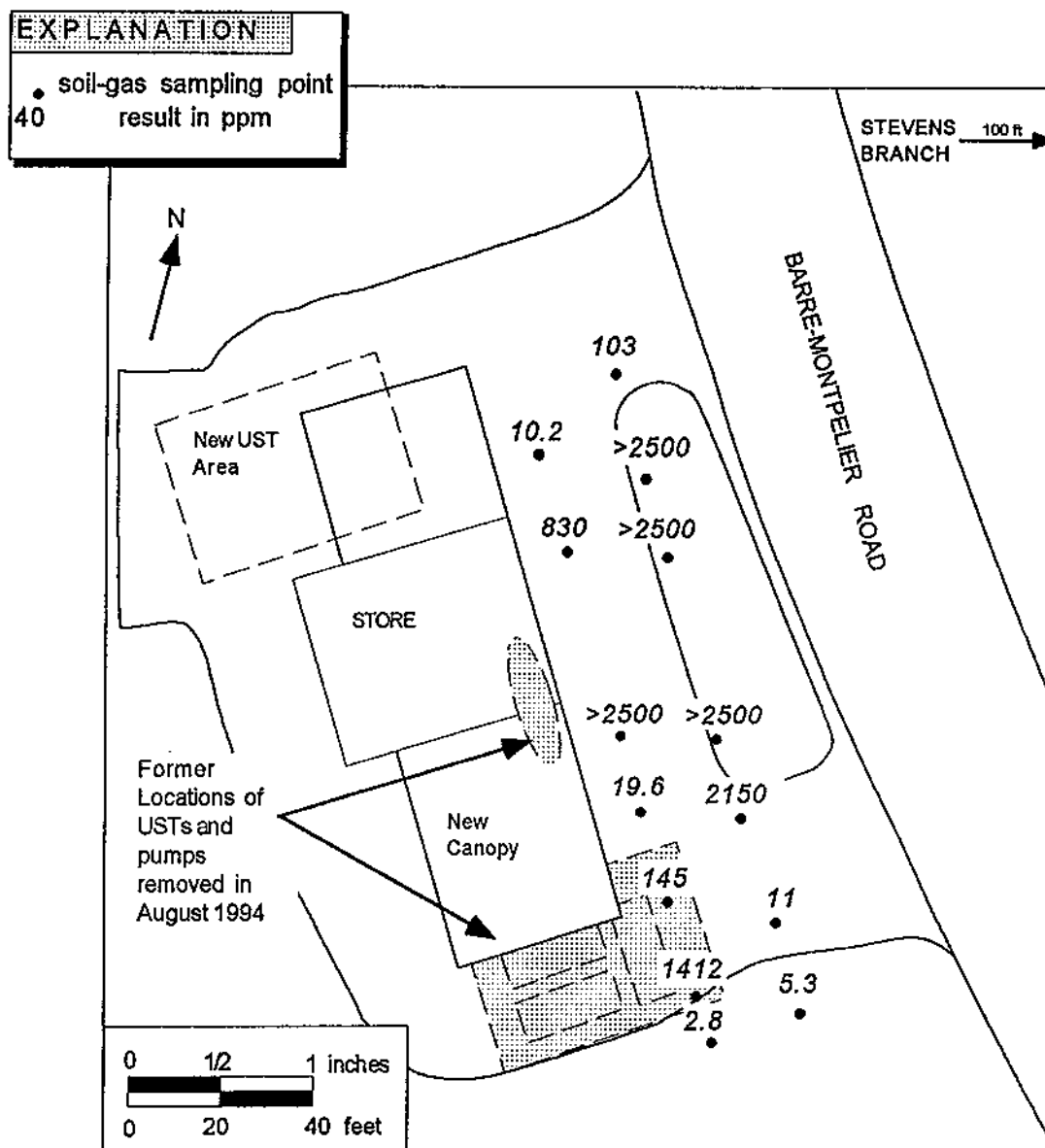


FIGURE 3
 Site basemap, Berlin Mobil Short Stop,
 Barre-Montpelier Road, Berlin, Vermont,
 SMS Site #94-1690.



PID readings taken with a Photovac MicroTIP HL-2000, 10.6 eV, calibrated to isobutylene, response factor = 1.0

FIGURE 5
PID soil-gas survey results, September 19, 1994,
Berlin Mobil Short Stop, Berlin, Vermont,
SMS Site #94-1690.

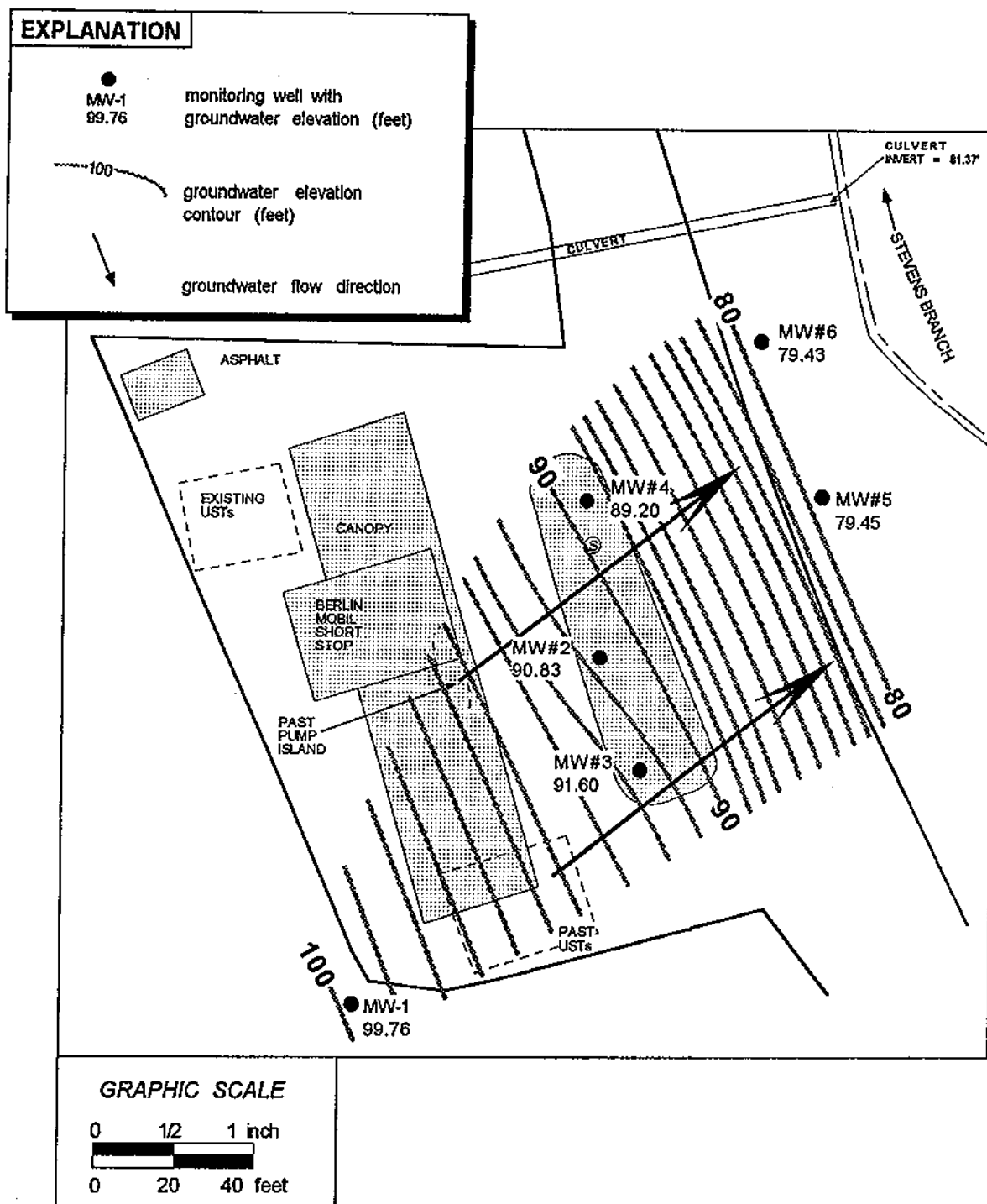


FIGURE 6
Groundwater elevation contour map, February 14, 1995,
Berlin Mobil Short Stop, Berlin, Vermont,
SMS Site #94-1690.

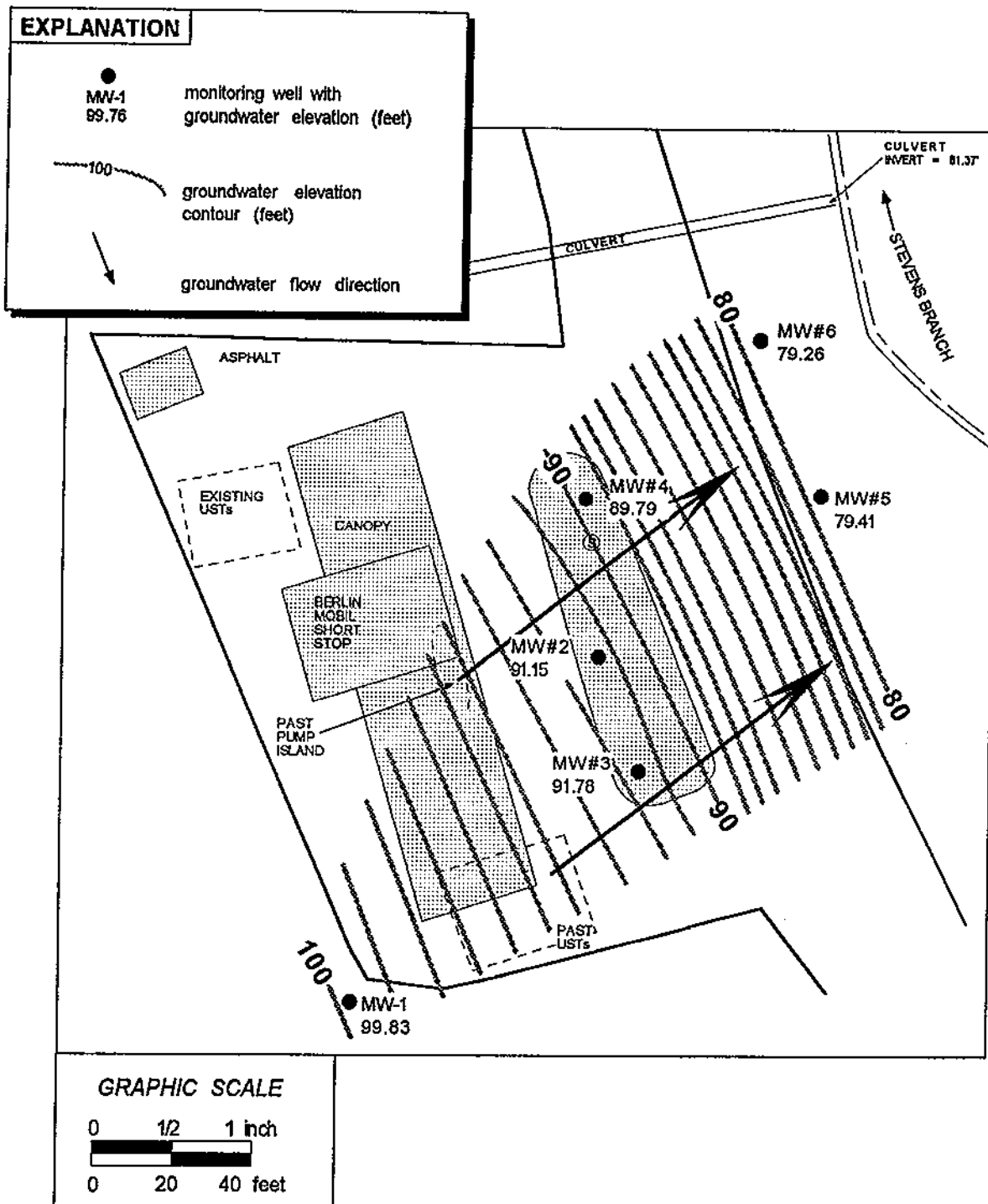


FIGURE 7
Groundwater elevation contour map, March 7, 1995,
Berlin Mobil Short Stop, Berlin, Vermont,
SMS Site #94-1690.

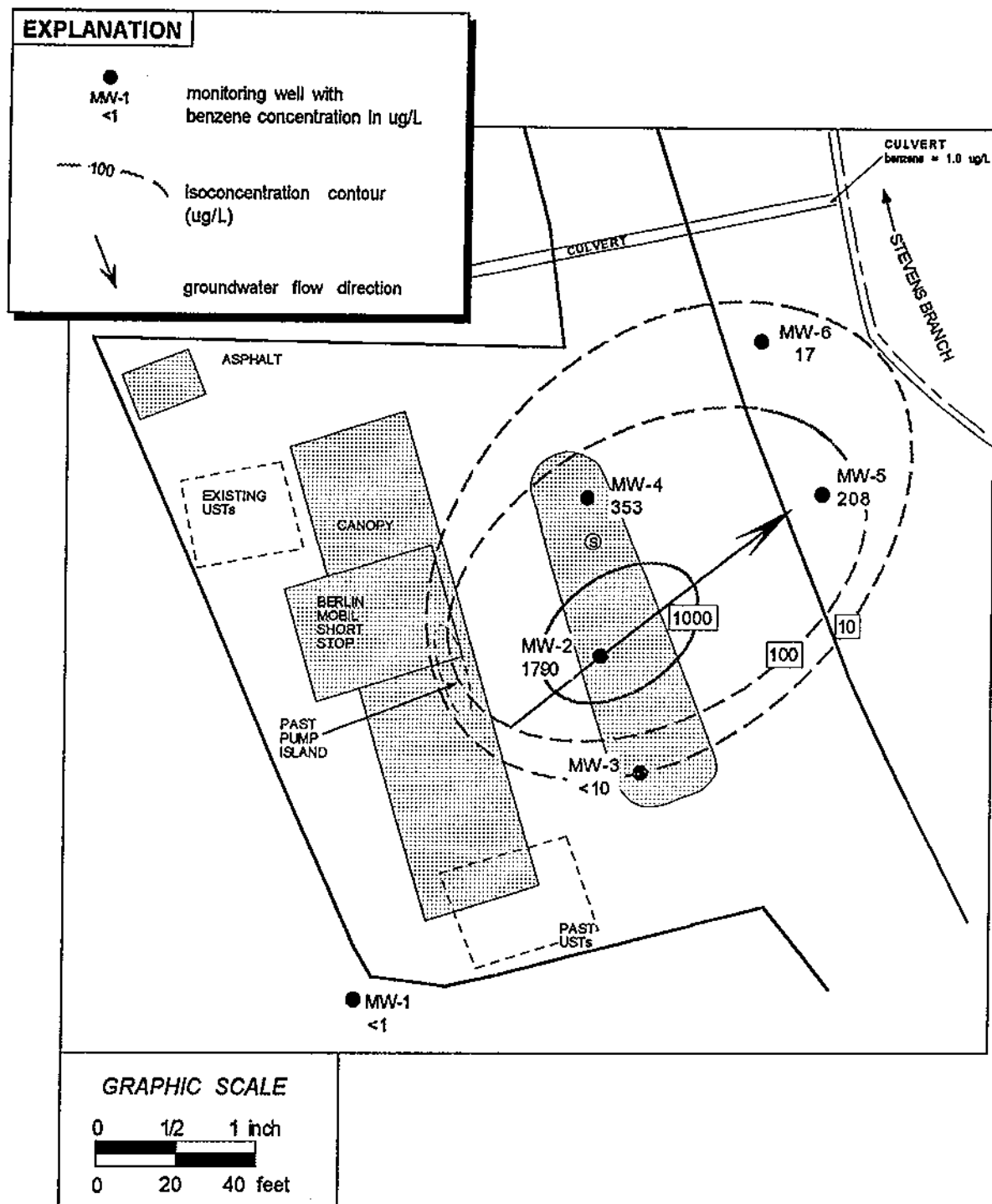


FIGURE 8
 Isoconcentration contour map for benzene in groundwater,
 March 7, 1995, Berlin Mobil Short Stop, Berlin, Vermont,
 SMS Site #94-1690.

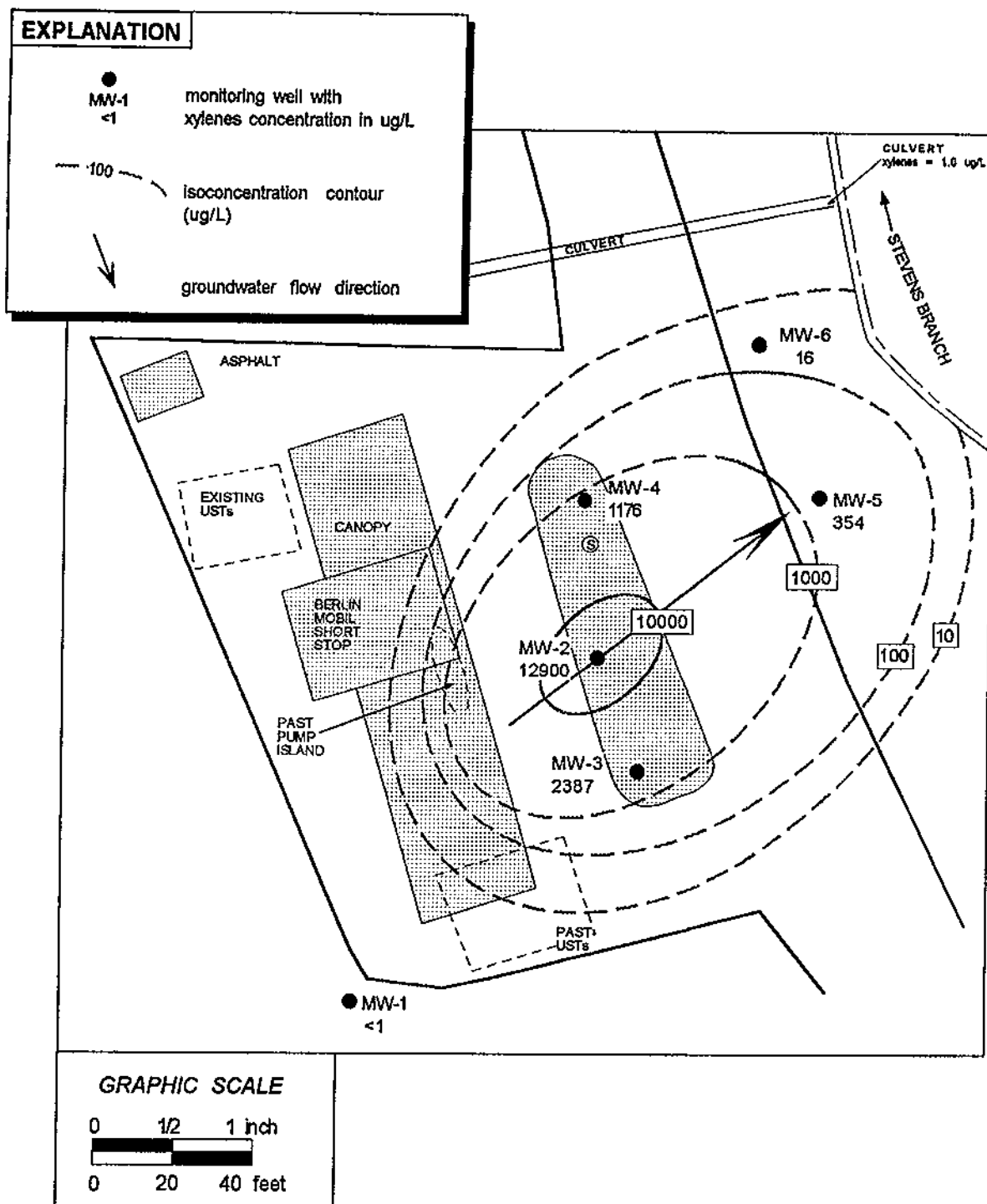


FIGURE 9
 Isoconcentration contour map for xylenes in groundwater,
 March 7, 1995, Berlin Mobil Short Stop, Berlin, Vermont,
 SMS Site #94-1690.

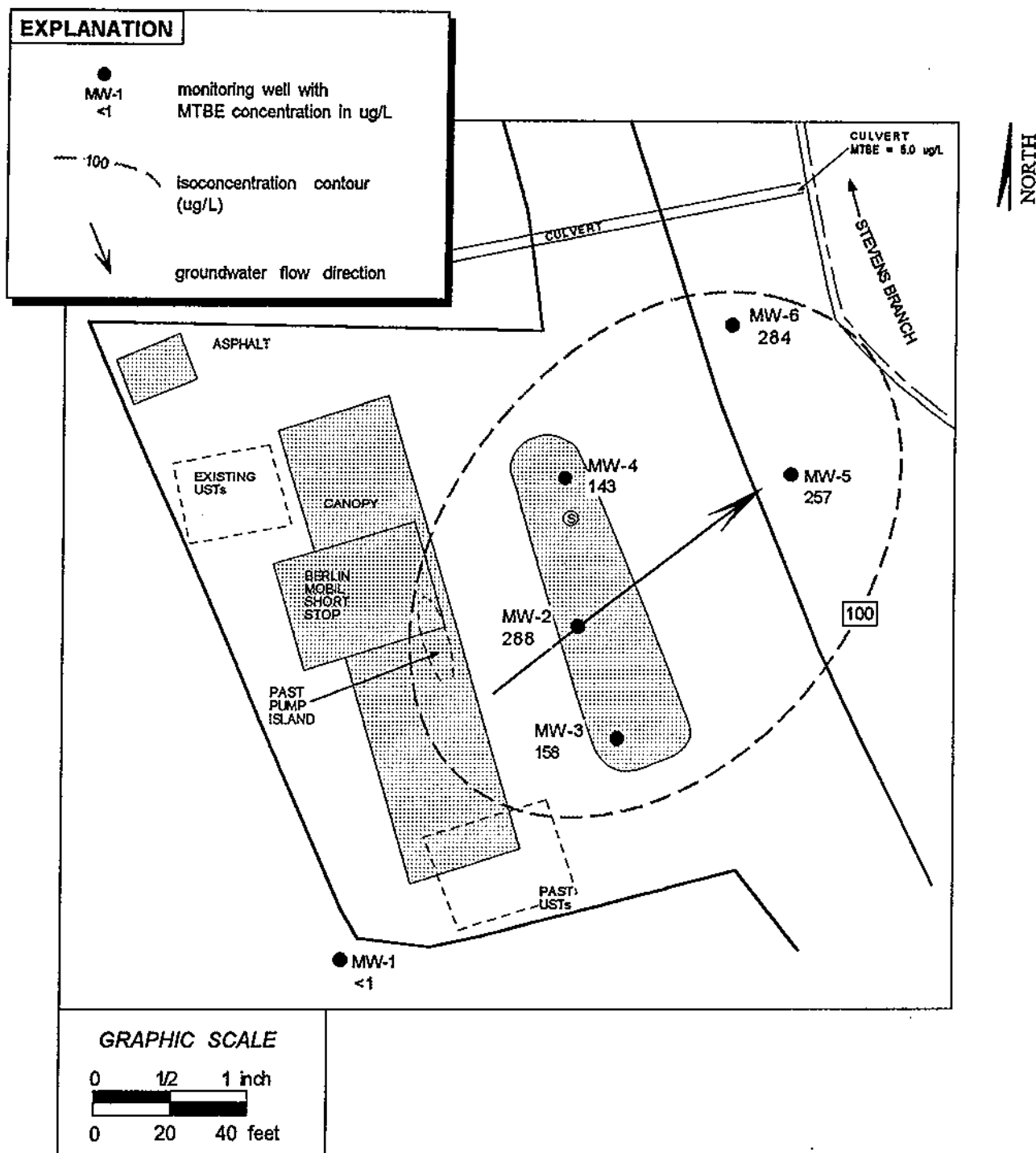


FIGURE 10
 Isoconcentration contour map for MTBE in groundwater,
 March 7, 1995, Berlin Mobil Short Stop, Berlin, Vermont,
 SMS Site #94-1690.

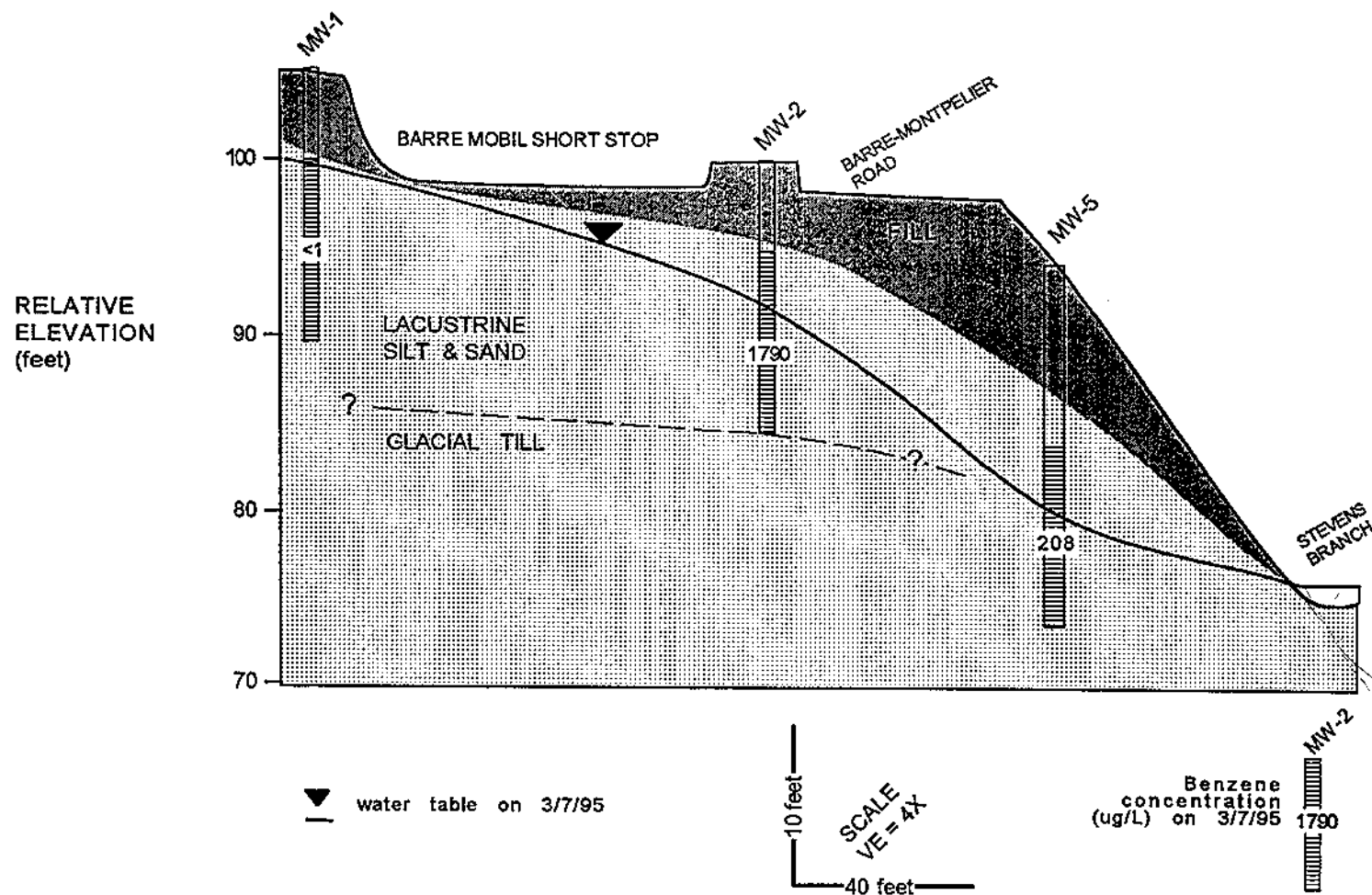


FIGURE 11
West to east cross section,
Berlin Mobil Short Stop, Berlin, Vermont, SMS Site #94-1690.

APPENDIX A
Relevant Correspondence

February 7, 1995

Matthew Moran, Site Manager
Site Management Section
VT DEC - Hazardous Materials Management Division
103 So. Main Street/West Building
Waterbury, Vermont 05671-0404

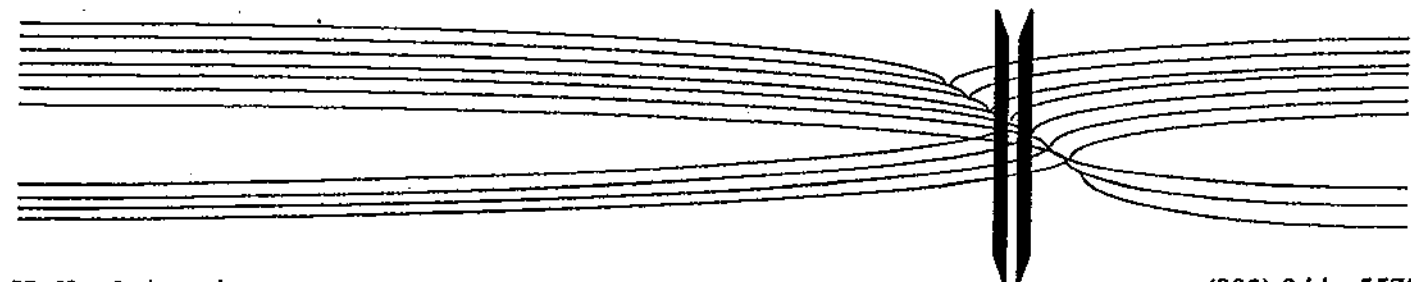
Re: Site Investigation at S.B. Collins' Berlin Mobil Short Stop, Barre-Montpelier Road,
Berlin, Vermont, SMS Site #94-1690

Dear Matt:

The purpose of this letter is to update you on the progress of the site investigation at the above-referenced site. Enclosed are groundwater monitoring results, site maps, and a cost estimate from Tri-State Drilling & Boring for additional monitoring well installations at the site.

As we discussed in our phone conversations, our attempts to install the two wells on the east side of the Barre-Montpelier road were unsuccessful. Using hollow-stem augers, we encountered refusal at depths of about five feet, probably on granite or concrete slabs which have been used as fill between the Barre-Montpelier Road and Stevens Branch, which located less than 50 feet east of the road. The enclosed price quote from Tri-State is for using their ODEX system to install the wells. I am confident that we will be able to install the wells using this method.

I've enclosed a cost estimate which summarizes the additional project costs that will be incurred if we install and sample the additional wells. I've also included another round of sampling the culvert in the cost estimate.



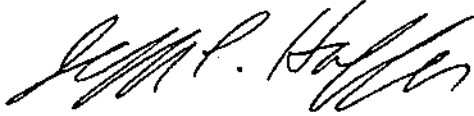
Hoffer & Associates
Consulting Hydrogeologists

(802) 244 - 5573
P.O. Box 428, Waterbury, Vermont 05676

Please let us know if you concur with our plans. Upon your verbal approval, we will initiate the work as soon as possible.

Sincerely,

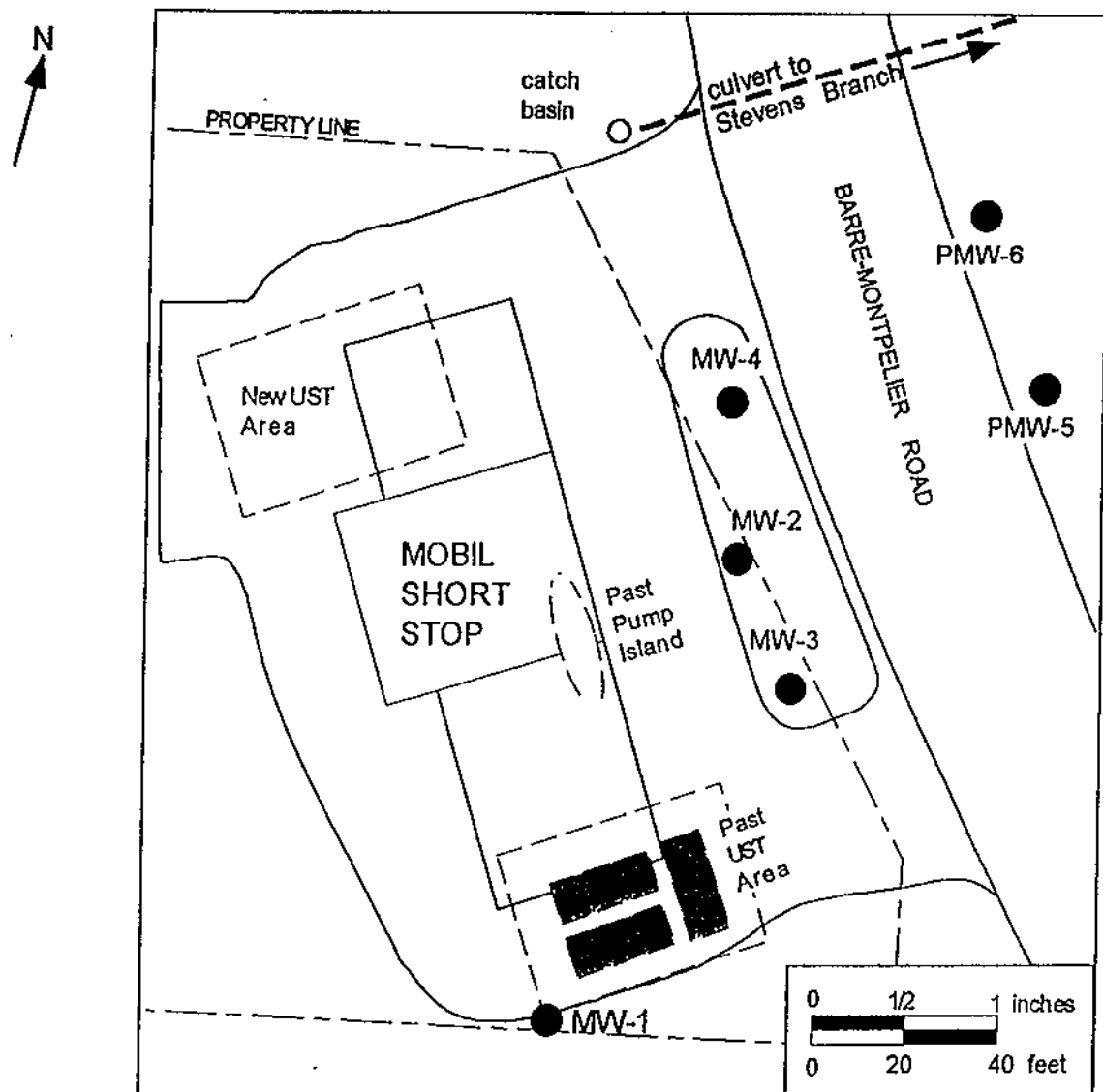
HOFFER & ASSOCIATES

A handwritten signature in dark ink, appearing to read "Jeff P. Hoffer", written in a cursive style.

Jefferson P. Hoffer
Principal Hydrogeologist

enc.

cc: Carl Ruprecht, S.B. Collins



DRAFT

FIGURE 1
Existing (MW) and proposed (PMW) monitoring well locations,
Barre Mobil Short Stop, Berlin, VT
(SMS Site #94-1690).

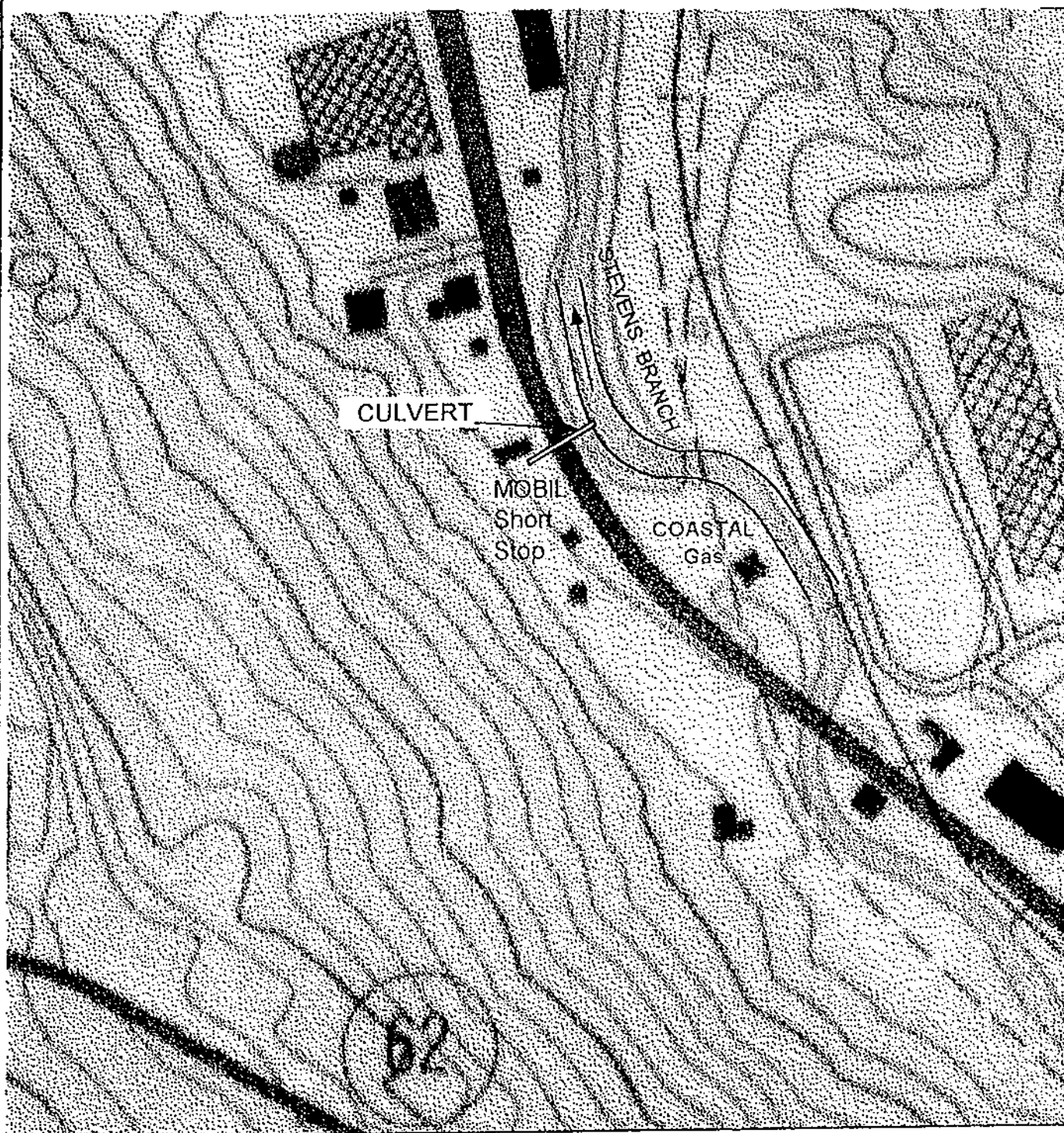


FIGURE 2
Site vicinity map, Barre Mobil Short Stop,
Berlin, Vermont.

DRAFT

TABLE 2
Water quality results for BTEX and MTBE,
Berlin Mobil Short Stop, Berlin, Vermont.
(results in µg/L)

DRAFT

Samples Collected on January 17, 1995

Sample ID	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
MW-1	<1	5	<1	<1	<1
MW-2	2110	10100	2880	21500	<200
MW-3	50 / 79	46 / 32	202 / 278	380 / 492	148 / 153
MW-4	1180	604	792	4450	852
Culvert*	2	<1	1	<1	10
Trip Blank	<1	<1	<1	<1	<1
Field Blank	<1	<1	<1	<1	<1

<1 = less than a detection limit of 1

22 / 22 = sample result and field duplicate result

*Culvert sampled at discharge point into Stevens Branch

REGULATORY THRESHOLDS
(µg/L)

Standard	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE
VT GES	5	2420	680	400	-
VT PAL	0.5	1210	340	200	-
VHA	1	1000	-	-	40
MCL	5	1000	700	10000	-

VT GES = Vermont Groundwater Enforcement Standard

VT PAL = Vermont Preventive Action Limit

VHA = Vermont Health Advisory

MCL = Maximum Contaminant Level

HOFFER & ASSOCIATES
Consulting Hydrogeologists

COST ESTIMATE

S.B.Collins, Inc.

Additional Monitoring Wells at the Barre Short Stop, Berlin, Vermont.

LABOR

<u>ITEM</u>	<u>Staff</u>	<u>Hours</u>	<u>Rate</u>	<u>Cost</u>
Monitoring Well Installation	TFS	8	\$35.00	\$280.00
Groundwater Sampling	TFS	2	\$35.00	\$70.00

Sub-Total Labor **\$350.00**

EXPENSES

<u>ITEM</u>	<u>Quantity</u>	<u>Rate</u>	<u>Cost</u>
Mileage, Well Installation	36	\$0.28	\$10.08
Dedicated Poly Bailers	2	\$6.00	\$12.00
PID Rental (for well installation)	1	\$75.00	\$75.00

Sub-Total Expenses **\$97.08**

Total Jefferson P. Hoffer **\$447.08**

SUB-CONTRACTORS

<i>Brooks Surveying</i>			<u>Cost</u>
Update Site Map			\$200.00

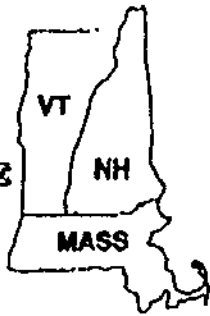
<i>Well Contractor - Tri State Drilling & Boring</i>			<u>Cost</u>
2 wells - see enclosed quote			\$1,948.00

<i>Laboratory - Scitest Laboratory Services</i>	<u>Quantity</u>	<u>Rate</u>	<u>Cost</u>
8020 analysis for BTEX/MTBE, 3 samples	3	\$55.00	\$165.00

Total Sub-Contractors **\$2,313.00**

PROJECT TOTAL **\$2,760.08**

**Tri State
Drilling &
Boring
Inc.**



- ☐ monitor wells
- ☐ soil borings
- ☐ shallow wells

office 802-467-3123

fax 802-467-8540

RFD #2, Box 113, West Burke, Vermont 05871

February 6, 1995

Mr. Jeff Hoffer
P.O. Box 428
Waterbury, VT 05676

RE: Mobil Short Stop, Barre-Montpelier, VT

Dear Mr. Hoffer:

As requested, Tri State Drilling and Boring is pleased to submit the following fee proposal for two monitor wells, at the above referenced location.

**Two Monitor Wells - 20' Deep - 2" Dia.
Odex Drilling**

10'	2" pvc screen	4.25/ft.	42.50
10'	2" pvc riser	2.25/ft.	22.50
1	2" pvc cap	7.00/ea.	7.00
1	2" pvc locking plug	17.00/ea.	17.00
3	100# bags sand	14.00/ea.	42.00
1	Bag bentonite	18.00/ea.	18.00
1	Road box	75.00/ea.	75.00
1.0	Well development	25.00/hr.	25.00
3.0	Hours drill & install	200.00/hr.	600.00
			849.00/ea.

Two Monitor Wells \$1,698.00

	Mobe & demobe	200.00
1	Steam cleaning	50.00/day
		50.00

Total Estimated Cost \$1,948.00

I would like to thank you for the opportunity to accommodate you on this project. Should you need any further assistance, please feel free to contact me.

Sincerely,

Neal S. Faulkner
Vice President
NSF/jal

September 22, 1994

Mr. Carl Ruprecht, UST Manager
S.B. Collins, Inc.
54 Lower Welden Street
St. Albans, VT 05478

Re: Scope of Work for Site Investigation
Barre Mobil Short Stop, Berlin, Vermont
Facility ID #0000811

Dear Carl:

This scope of work has been prepared for a site investigation at the Barre Mobil Short Stop in Berlin, Vermont. The site assessment for the July 29, 1994 closure of three underground storage tanks (USTs) and associated piping at the site was presented in our letters dated August 2 and 8, 1994. Although no free product was observed, elevated concentrations of organic vapors were detected in soil and groundwater sample headspaces during the UST closures, indicating that historical releases of petroleum have occurred at the site. A grab water sample collected from shallow groundwater within the former UST excavation pit contained dissolved BTEX and MTBE (benzene - 195 $\mu\text{g/L}$, toluene - 450 $\mu\text{g/L}$, ethylbenzene - 317 $\mu\text{g/L}$, xylenes - 1230 $\mu\text{g/L}$, MTBE - 1480 $\mu\text{g/L}$). A soil-gas survey performed on September 19, 1994, encountered elevated organic vapors east of the former USTs, piping, and pump island.

The three USTs removed in July were in excellent condition with no evidence of corrosion, or holes on any tank surfaces. Based on the integrity of the removed USTs, it is likely that the observed impacts were due to overfilling practices over time, leaks from piping runs and/or dispensers, or possibly from pre-1989 USTs or piping at the site.

A site investigation is necessary to define the degree and extent of contamination at the site. The following scope of work has been prepared in accordance with Site's Management Section (SMS) most recent guidelines published in May, 1994. Since this site investigation is not being performed under the "expressway", this scope of work should be reviewed by the SMS prior to proceeding with the work elements.

Jefferson P. Hoffer
Consulting Hydrogeologists

(802) 244 - 5573
P.O. Box 428, Waterbury, Vermont 05676

SOIL GAS SURVEY

A soil gas survey was performed on September 19, 1994, to identify areas of elevated organic vapors at the site. A photoionization detector (PID) was used to measure levels of organic vapors present in the shallow subsurface. A Photovac MicroTIP HL-2000 (10.6 eV lamp, calibrated to respond to isobutylene) was utilized. Soil-gas data was collected by manually driving a 3/4-inch, stainless-steel slam bar to a depth of at least two feet. The slam bar was then retracted and replaced with a two foot, stainless-steel sampling tube, which was sealed in the probe hole to prevent atmospheric air from entering. The PID sampling port was connected to the sampling tube, and two PID measurements were recorded for each sampling point. Two measurements were obtained; the maximum reading (which usually occurred in less than one minute), and the reading at one minute (unless the maximum reading of the instrument was exceeded prior to one minute). Figure 1 presents the data collected during the soil-gas survey.

Elevated organic vapor concentrations were detected east of the former USTs, piping and pump island. The highest readings were detected east of the former pump island, although elevated readings were also detected east of the former USTs. The elevated readings suggest that petroleum contamination is migrating westward toward the Stevens Branch, consistent with the inferred groundwater flow direction.

SCOPE OF WORK

The following activities will be performed at the site in order to complete the initial site investigation requirements:

- **General Site Characterization** - The general site characterization will include information on the environmental setting and site history. Sources for this information include USGS topographic and geologic maps, SCS soil maps, geologic and hydrogeologic reports, and the DEC Water Supply Division's water well inventory database. Surface waters, wetlands, other relevant hydrologic features, and other potential receptors in the vicinity will be identified.

A site location map will be prepared using a 1:24,000 USGS topographic map as a base. A site vicinity map will be prepared using a 1:5,000 orthophoto or enlarged USGS topographic map to display local features. A site map at a scale of 1 inch to 40 feet will be used to display monitoring well locations, groundwater elevation contours, and contaminant isoconcentration maps.

- **Groundwater Monitoring Well Installation** - Based on the data obtained during the initial site assessment and the soil-gas survey, four groundwater monitoring wells are proposed. The proposed locations of these monitoring wells are provided on Figure 2.

Observations during the UST closures and subsequent excavation activities indicate that a shallow zone of perched groundwater exists at the site, at a depth of

approximately two to three feet. The inferred direction of groundwater flow is eastward or northeastward, toward Stevens Branch. Site soils include the fine to medium grained angular gravel and silty sand used as fill in both the former and new UST excavations, a brown silt unit, a gravelly sand and gravel unit, and a dense, dark gray till unit, consisting of silty sand and angular gravel. The permeable soils above the till unit provide a thin and shallow zone for groundwater accumulation. This zone is targeted for groundwater monitoring.

Based on the shallow depths of the perched groundwater at the site, we recommend using Adams Engineering Mini-Rig to install small diameter monitoring wells. We have successfully used this technique to install 1.5-inch monitoring wells at other sites with similar subsurface conditions, and feel that this would be the most cost-effective method for drilling at the site.

Boreholes will be advanced by driving a hollow-barrel sampling tube to an approximate depth of 10 feet. Soil samples will be collected continuously and will be characterized using the ASTM Modified Unified Soil Classification System.

Soil samples will be field-screened using a PID to qualitatively assess soil contamination. Soil headspace measurements will be obtained by placing soil samples collected from the sample tube and placed into zip-lock bags or glass jars sealed with aluminum foil, and sampling the headspace in the containers using a PID. Soil samples will be collected for screening both at regular intervals within the profile and at contacts between different soil types.

Wells will be constructed with 5-foot (or longer) sections of 1.5-inch factory-slotted (10-slot), flush-threaded, PVC well screen. The well screens will be positioned so that the top of the screen remains above the seasonal high water table, as judged by observations during well drilling. Flush-threaded PVC riser will be extended from the top of the screen to the ground surface. The well screens will be backfilled with an appropriately sized, commercially-sorted sand. The wells will be completed with a flush-mounted protective casing set in cement. After well installation, the wells will be developed by either bailing or pumping. If possible, water-level recovery measurements will be taken after development in order to assess hydraulic conductivity values for the wells. All development waters will be collected and placed into a 55-gallon drum at the site. Geologic and monitoring well construction logs will be prepared to document the stratigraphy and well construction details.

During the well drilling and installation activities, the PID will be utilized to monitor for the presence of organic vapors. Vapor monitoring will be used to detect zones of contamination, and also to monitor worker air-space for health and safety concerns.

Prior to drilling, DIG-SAFE will be contacted to alert subsurface utility owners of the drilling activities. In addition, arrangements will be made with local water and sewer authorities to locate water, wastewater, and stormwater utilities.

For the purposes of this scope of work, we have utilized unit costs from Adams Engineering, of Underhill, Vermont, to estimate well drilling and construction costs.

- **Groundwater Sampling** - One set of groundwater samples will be collected from each monitoring wells. Prior to sampling, depth to water, PID well headspace, and free product (if present) thickness determinations will be made. Wells will be purged of three well volumes or until dry prior to sampling. Samples will be collected using dedicated bailers. Any non-dedicated sampling equipment will be decontaminated between sampling points with an Alconox scrub/tap water rinse/methanol rinse/deionized water rinse. Quality assurance/quality control samples will include trip blank, a field/equipment blank (if non-dedicated equipment is used), and a blind duplicate. The trip blank will be provided by the laboratory and will be transported to the site, handled with the groundwater samples and returned to the laboratory for analysis. If necessitated by the use of non-dedicated equipment, the field/equipment blank will be prepared by pouring deionized water through the decontaminated sampling apparatus, in order to determine the effectiveness of the decontamination procedure and possible sample exposure to airborne contaminants.

The samples will be appropriately labeled and placed into a cooler with water ice. The samples will be transported to Scitest Laboratory Services, Randolph, Vermont, and analyzed for MTBE and BTEX using EPA Method 8020. A laboratory chain-of-custody and a field sampling data sheet will be utilized to document the sampling event.

- **Groundwater elevation surveys** - Depth to water measurements will be taken in the site monitoring wells on at least two occasions. Depth to water measurements will be converted to groundwater elevations to allow preparation of groundwater elevation contour maps depicting groundwater flow directions.
- **Site survey/basemap preparation** - The basemap will include relevant site features, monitoring well elevations (ground surface and top of casing), and monitoring well locations. If possible, site elevations will be measured relative to a USGS benchmark in feet above mean sea level. If not, an on-site benchmark will be assigned an arbitrary reference elevation.
- **Report preparation** - All information collected during the investigation will be incorporated into a final report. The report will describe the environmental setting, the nature and extent of contamination found at the site, identify potential receptors, and discuss the qualitative risks posed by site contamination to the potential receptors. The report will include well logs, vicinity and site maps, tabulated groundwater elevation and analytical results, contour maps, isoconcentration maps, cross-sections, and all raw data. The report will provide recommendations concerning the need for further characterization, remedial approaches if deemed appropriate, and/or monitoring frequencies.

- **Health & Safety** - A Health & Safety Plan will be prepared for work performed at the site.

ESTIMATED COST

The estimated costs to perform this site investigation are estimated as follows:

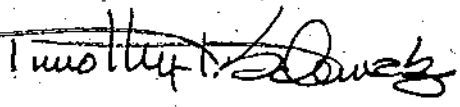
<u>Contractor</u>	<u>Cost</u>
Jefferson P. Hoffer, Consulting Hydrogeologists	\$2570.32
Adams Engineering	\$ 800.00
Scitest Laboratory Services	\$ 385.00
<u>Brooks Land Surveying</u>	<u>\$ 300.00</u>
TOTAL	
	\$4055.32

These estimated costs are further broken down on the enclosed cost estimate sheet. Since we have assumed that S.B. Collins will be responsible for hiring the sub-contractors directly, the project cost does not include sub-contractor mark-up fees.

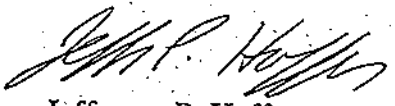
Our services will be provided and billed in accordance with the attached Standard Terms. S.B. Collins acknowledges having read and agreed to these rates and terms upon acceptance of this proposal. We thank you for the opportunity be of continued service to S.B. Collins. You can authorize the work by signing below or issuing a purchase order.

Respectfully submitted,

Accepted by:


Timothy F. Schmalz
Project Geologist

Authorized Signature


Jefferson P. Hoffer
Principal Hydrogeologist

Title

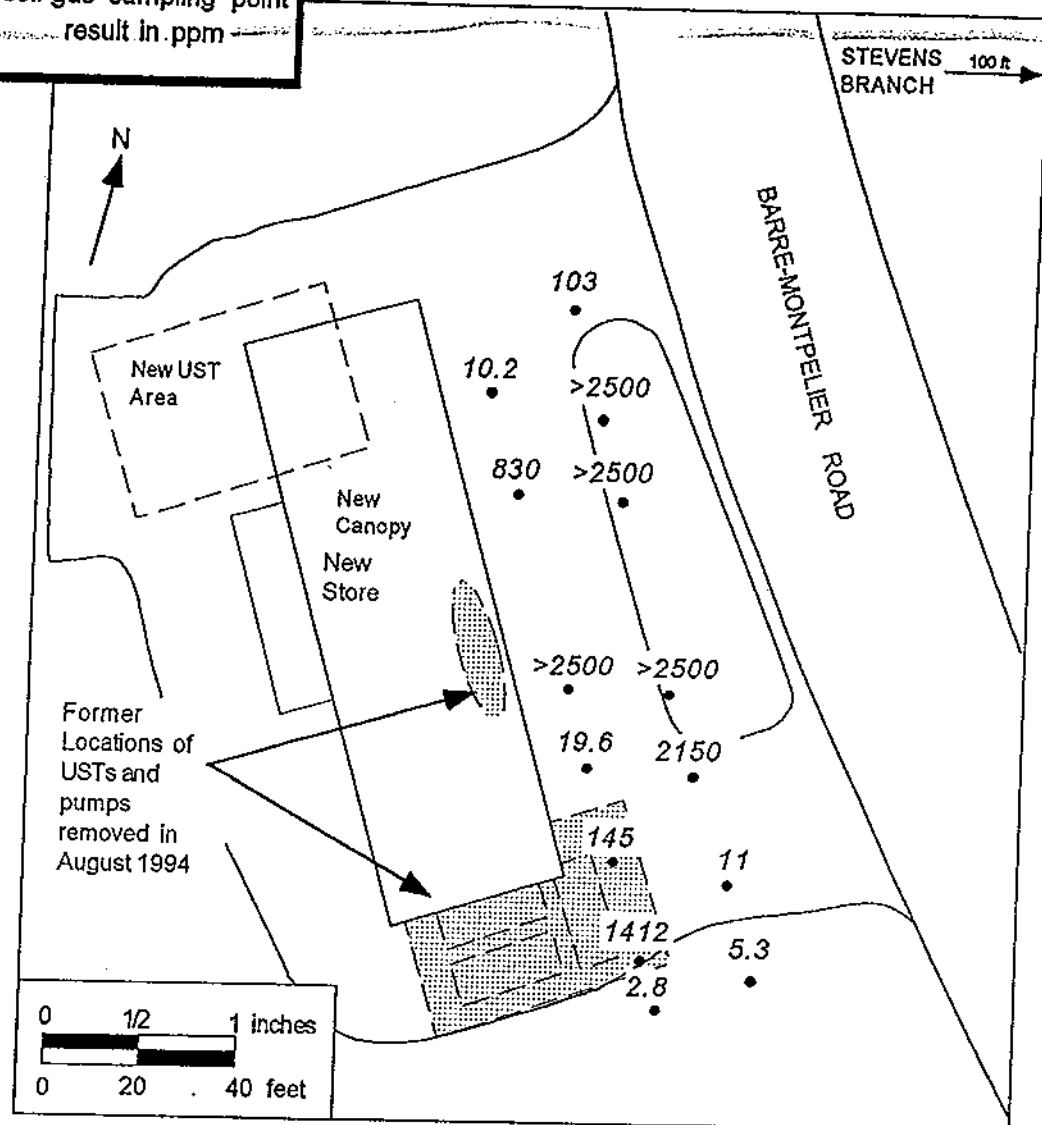
Date

Enc.

Jefferson P. Hoffer

Consulting Hydrogeologists

EXPLANATION
 • soil-gas sampling point
 40 result in ppm



PID readings taken with a Photovac MicroTP HL-2000, 10.6 eV, calibrated to isobutylene, response factor = 1.0

FIGURE 1
 PID soil-gas survey results, September 19, 1994,
 Barre Mobil Short Stop, Berlin, VT

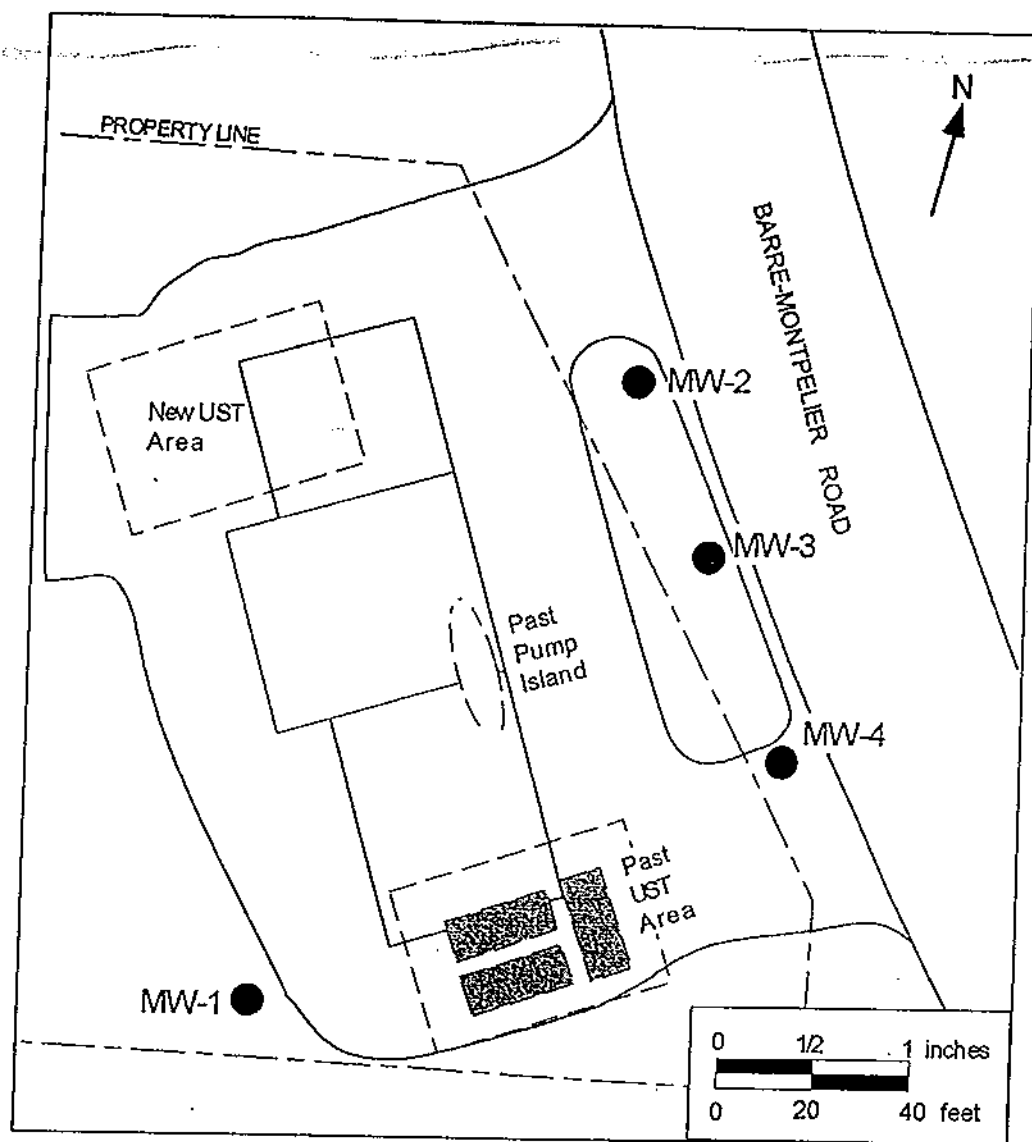


FIGURE 2
Proposed monitoring well locations,
Barre Mobil Short Stop, Berlin, VT

JEFFERSON P. HOFFER
Consulting Hydrogeologists

COST ESTIMATE

S.B. Collins, Inc.

Site Investigation at the Barre Short Stop, Berlin, Vermont.

LABOR

ITEM	Staff	Hours	Rate	Cost
Health & Safety Plan	JPH	2	\$35.00	\$70.00
Background Information Review	TFS	4	\$30.00	\$120.00
Monitoring Well Installation	TFS	8	\$30.00	\$240.00
Well Development/Water Levels	TFS	6	\$30.00	\$180.00
Groundwater Sampling	TFS	6	\$30.00	\$180.00
Figure Preparation	JPH	8	\$35.00	\$280.00
Report Preparation	TFS	32	\$30.00	\$960.00
Report Review	JPH	8	\$35.00	\$280.00

Sub-Total Labor **\$2,310.00**

EXPENSES

ITEM	Quantity	Rate	Cost
Mileage, 4 trips, 36 miles round trip	144	\$0.28	\$40.32
Dedicated Bailers	4	\$30.00	\$120.00
PID Rental (for well installation)	1	\$75.00	\$75.00
PID Rental (for well headspaces)	1	\$25.00	\$25.00

Sub-Total Expenses **\$260.32**

Total Jefferson P. Hoffer **\$2,570.32**

SUB-CONTRACTORS

Surveyor - Brooks Land Surveying	Quantity	Rate	Cost
Well elevations	1	\$300.00	\$300.00
Well Driller - Adams Engineering	Quantity	Rate	Cost
4 wells @ \$200/well	4	\$200.00	\$800.00
Laboratory - Scitest Laboratory Services	Quantity	Rate	Cost
8020 analysis for BTEX/MTBE, 7 samples	7	\$55.00	\$385.00

Total Sub-Contractors **\$1,485.00**

ESTIMATED PROJECT TOTAL **\$4,055.32**

JEFFERSON P. HOFFER
Consulting Hydrogeologists

STANDARD TERMS - 1994

INVOICES

Invoices are payable upon receipt. All payments are due within fifteen (15) days of the invoice date. Invoices not paid within fifteen days shall be subject to interest from the 16th day at the rate of 1.5% per month.

ESTIMATED COST

Unless stated otherwise, work is performed on a time and materials basis. The estimated costs and schedule proposed are based on a best judgment of the requirements known at the time of the proposal. Unforeseen circumstances and changes in the scope of work or schedule can influence whether or not costs are above or below the estimate. If work is performed with a specified not-to-exceed cost and during work implementation it appears that the not-to-exceed cost may be exceeded, the Client will have the following options; authorize additional funds to complete the work, redefine the scope of work in order to fit the remaining funds, or request that all work be halted at a specific expenditure. If the last option is selected, all work such as data and results will be turned over to the Client with no further obligation or liability to either party.

LIMITED WARRANTY

Jefferson P. Hoffer, Consulting Hydrogeologists (JPHCH), will render services in a professional manner and use that degree of care and skill ordinarily exercised under similar conditions by reputable and competent environmental and hydrogeologic consultants practicing in the same or similar locations. JPHCH's professional liability for services performed or provided shall be limited to the amount paid JPHCH hereunder. No other warranty, whether expressed or implied, is made or intended for services performed or provided. Client assumes all responsibility and shall defend and hold harmless JPHCH for Client's decisions relating to its uses of the services provided and reliance thereon. The remedies set forth in this paragraph are exclusive.

HEALTH AND SAFETY REQUIREMENTS

For work performed at hazardous waste sites, JPHCH personnel will be responsible for Health & Safety requirements contained in the Occupational Safety and Health Administration's requirements presented in 29 CFR Part 1910.120. Clients and sub-contractors will be responsible for the health and safety of their employees.

TERMINATION

This agreement may be terminated by either party on thirty (30) days written notice. In the event that the Client terminates the agreement, the Client shall pay JPHCH the costs incurred to the effective date of termination.



State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
Natural Resources Conservation Council
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
Hazardous Materials Management Division
103 South Main Street / West Building
Waterbury, Vermont 05671-0404
802-241-3888
FAX 802-241-3296

October 26, 1994

Carl Ruprecht
S.B. Collins, Inc.
54 Lower Weldon Street
St. Albans, VT 05478

RE: Workplan approval for the Barre Short Stop in Berlin (Site #94-1690)

Dear Mr. Ruprecht:

The Sites Management Section (SMS) has reviewed the workplan dated September 22, 1994 that Timothy F. Schmaltz and Jefferson P. Hoffer, Consulting Hydrogeologists, have developed for the above referenced site. This workplan includes a general site characterization, the installation of four monitoring wells, collection and analysis of groundwater samples from these wells by EPA Method 8020, a groundwater elevation survey, and the preparation of a summary report. In addition, the SMS requests that the small stream flowing along the northern boundary of the site also be sampled for BTEX and MTBE compounds by EPA Method 8020. The SMS approves of this workplan as submitted. This includes a cost not to exceed \$4,055.32, plus an additional \$55 for the stream water sample.

Please keep the SMS informed of work scheduled to be performed at the site, as well as forwarding sampling and analytical results as they become available. The SMS looks forward to the completion of this work. Please feel free to call with any questions or comments.

Sincerely,

Richard Spiese, Acting Supervisor
Sites Management Section

CC: Timothy Schmaltz, Consulting Hydrogeologists

RS:JPF/wp51/941690r2



State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
Natural Resources Conservation Council
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
Hazardous Materials Management Division
103 South Main Street / West Building
Waterbury, Vermont 05671-0404
802-241-3888
FAX 802-241-3296

October 20, 1994

Carl Ruprecht
S.B. Collins, Inc.
54 Lower Weldon Street
St. Albans, VT 05478

RE: Petroleum contamination at the Barre Short Stop in Berlin
(Site #94-1690)

Dear Mr. Ruprecht:

The Sites Management Section (SMS) has received the August 2, 1994 report outlining the subsurface assessment for the above referenced site, conducted by Jefferson P. Hoffer of Consulting Hydrogeologists. This report summarizes the degree and extent of contamination encountered during the assessment on July 29, 1994.

S.B. Collins, Inc. arranged the removal of three 12,000 gallon underground storage tanks (USTs) containing gasoline. Soils screened at the limits of the excavation had peak concentrations of 25 ppm as measured by a photoionization detector (PID). All excavated soil was backfilled since the full extent of the contamination was unknown. No free phase product or petroleum sheens were observed on the water table encountered at a depth of four feet below the ground surface.

A small stream flows along the northern boundary of the site. Flow from this stream is directed through a culvert under the Barre-Montpelier Road into the Stevens Branch of the Winooski River, located a few hundred feet east of the site. Based on the above information, the SMS has determined that additional work is necessary at the site in order to determine the severity of contamination present. Due to the possibility of contaminant impact to nearby receptors, the SMS is requesting that S.B. Collins, Inc. retain the services of a qualified environmental consultant to perform the following:

1. Further define the degree and extent of contamination to the soil. This may be accomplished by obtaining soil borings, digging test pits, or performing a soil gas survey.
2. Determine the degree and extent of contamination, if any, to groundwater. If soil is found to contain evidence of contamination at the water table, then a sufficient number of monitoring wells should be installed in locations which will adequately define the severity of contamination at the site. All groundwater samples taken should be analyzed for BTEX and MTBE compounds.

3. Perform an assessment of the site to determine the potential for sensitive receptors to be impacted by the contamination. This should include basements of adjacent buildings, the nearby surface water, and the public and private drinking water wells which are located within the vicinity of the site. If any water supplies appear at risk from this contamination, they should be sampled and analyzed using EPA 8020.

4. Determine the need for a long term treatment and/or monitoring plan which addresses any identified contamination present at the site. The need for such a plan should be based on the results of the above investigations.

5. Submit to the SMS a summary report which outlines the work performed as well as providing conclusions and recommendations. Included should be detailed well logs, analytical data, a site map, an area map, and a groundwater contour map.

Please have your consultant submit a preliminary workplan or Site Expressway Notification Form within fifteen days of your receipt of this letter so that it may be approved prior to the initiation of onsite work. The underground storage tanks at the Barre Short Stop are covered by the Petroleum Cleanup Fund as set forth in 10 V.S.A. Section 1941, as long as no private insurance exists which would apply to this situation. The owner or permittee must pay for the removal or repair of the failed UST and for the first \$10,000 of the cleanup; after that the fund will reimburse the tank owner or permittee for additional costs up to \$1 million. Additionally, the Secretary of the Agency of Natural Resources reserves the right to seek cost recovery of fund monies spent at Barre Short Stop if the Secretary concludes that S.B. Collins, Inc. was in significant violation of the Vermont Underground Storage Tank statutes (10 V.S.A. Chapter 59). If you have any questions, please feel free to call.

Sincerely,



Richard Spiese, Acting Supervisor
Sites Management Section

Enclosures.

CC: Jefferson P. Hoffer, Consulting Hydrogeologists
Berlin Selectboard
DEC Regional Office

RS:JPF/wp51/941690

August 8, 1994

Carl Ruprecht, UST Manager
S.B. Collins, Inc.
54 Lower Welden Street
St. Albans, VT 05478

Re: Site Assessment, Barre Mobil Short Stop, Berlin, Vermont
(Facility ID #0000811)

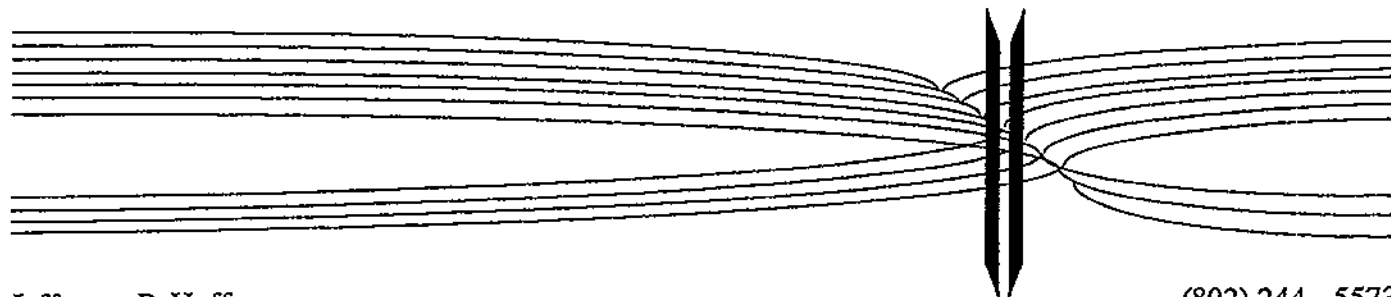
Dear Carl:

This letter updates our August 2, 1994 letter concerning the site assessment at the Barre Mobil Short Stop site in Berlin, Vermont. The site was visited by Timothy F. Schmalz, Project Geologist, on August 2 and 4, 1994, to observe the excavation for the new location of the site USTs. We have also received the analytical results from Scitest for the grab water sample which was collected during the UST removals on July 29. In addition, the photographs taken during the UST removals have been received and two sets are enclosed.

The analytical results for the grab water sample are as follows;

<u>Constituent</u>	<u>Concentration (in $\mu\text{g/L}$)</u>
benzene	195
toluene	450
ethylbenzene	317
xylene	1230
MTBE	1480

These results indicate that shallow groundwater has been impacted by releases of petroleum at the site. The source of this release is unknown. The tanks appeared to be virtually brand new when excavated on July 29. No obvious breaks or leaks within the piping was observed. Releases may have occurred from overfilling, or from leaks in the piping runs or pump dispensers, or from pre-1989 USTs or piping at the site.



Jefferson P. Hoffer
Consulting Hydrogeologists

(802) 244 - 5573
P.O. Box 428, Waterbury, Vermont 05676

During his site visit on August 2, Tim observed the installation of a drainage pipe in the vicinity of the excavation for the UST installations (see Figure 1). The drainage pipe was apparently installed to convey shallow groundwater from the new excavation to the drainageway on the northern perimeter of the site. A photoionization detector (PID) was utilized to screen the exposed soils for organic vapors. No readings were detected with the PID (MicroTIP) in the soils exposed in the trench.

On August 4, Tim observed the new excavation pit. No PID readings above a background of 2 to 3 ppm were detected in soils exposed in the pit. The soils consisted of native soil, primarily sandy silt and sandy clay (till). Approximately six inches of water was observed in the bottom of the excavation pit. Perched groundwater entered the pit from two locations; from an area on the northern sidewall, and from an area near the ramp leading into the pit on the eastern side of the excavation.

Based on our observations at the site, it appears that groundwater at the site occurs within shallow perched zones. As observed during the UST excavations on July 29, the coarse backfill materials around the tanks and piping provided a high permeability zone (relative to the low permeability surrounding soils) for groundwater to accumulate. Only a small amount of water entered the new excavation, which was dug to a depth of 14 feet.

SUMMARY

Three 12,000 gallon USTs were excavated at the Barre Mobil Short Stop in Berlin, Vermont, on July 29, 1994. The tanks were being relocated on the site to allow the construction of a canopy as part of a site renovation. The tanks are double-contained and were installed in August 1989. The tanks appeared to be virtually brand new, with no little or no signs of weathering or corrosion. The tanks were submerged in groundwater, which accumulated within the coarse, tank-backfill material.

Slightly elevated PID readings were detected in soil and water surrounding the tanks. The laboratory analysis of a grab water sample collected from the excavation pit showed elevated concentrations of dissolved petroleum constituents, indicating that releases of petroleum have occurred at the site. The source of this release is unknown; both the tanks and piping at the site appeared to be in good shape. Releases may have occurred from overfilling, or from leaks in the piping runs or pump dispensers, or may be remnant from releases from site USTs prior to 1989.

No elevated PID readings were detected in the new excavation. The new excavation exposed native soils, which consist of sandy clay and silty clay (till). A small amount of water entered the excavation, but no true water table conditions were encountered.

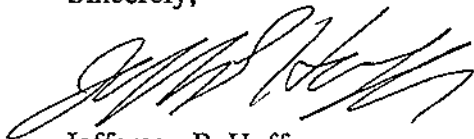
RECOMMENDATIONS

In order to define the degree and extent of groundwater contamination, it is recommended that four groundwater monitoring wells be installed at the site. Proposed well locations are shown on Figure 2. One well is located upgradient, two wells are located downgradient from the former location of the USTs, and the fourth well is downgradient from the former piping and pump island. Based on our observations during site work, the target zone of monitoring should be the shallow perched groundwater zone observed at a depth of about two feet. As a result, it is anticipated that the monitoring wells at the site will be shallow, probably less than 10 feet.

A soil-gas survey (prior to well installations) may also be worthwhile at the site, in preliminarily assessing the extent of contamination.

If you would like us to prepare a workplan for additional activities at the site, please let us know.

Sincerely,



Jefferson P. Hoffer
Principal Hydrogeologist

enc.

P.O. Box 339
 Randolph, Vermont 05060-0339
 (802) 728-6313
 (802) 728-6044 (FAX)

LABORATORY REPORT

CLIENT: SB Collins Inc.
 ADDRESS: 54 Lower Welden
 St. Albans, VT 05478

LABORATORY NO: 4-1724
 PROJECT NO: 70249

ATTENTION Carl Ruprecht
 MATRIX: Water

DATE OF SAMPLE: 7/29/94
 DATE OF RECEIPT: 7/29/94
 DATE OF ANALYSIS: 8/2/94
 DATE OF REPORT: 8/5/94

Groundwater Results

Parameter	G-1
Methyl tert-Butyl Ether	1480
Benzene	195
Toluene	450
Chlorobenzene	< 200
Ethylbenzene	317
1,3-Dichlorobenzene	< 200
1,2-Dichlorobenzene	< 200
1,4-Dichlorobenzene	< 200
Xylenes	1230
Surrogate % Recovery	83%

EPA Method 8020, Results reported as ug/L or ppb

c: Jeff Hoffer
 PO Box 428
 Waterbury, VT 05676

Respectfully submitted,

SCITEST, INC.

Roderick J. Lamothe
 Roderick J. Lamothe
 Laboratory Director

Post-It™ Fax Note	7671	Date	8/5/94	# of pages	1
To	Jeff Hoffer	From	Jim Morris		
Co/Dept.		Co	Scitest		
Phone #		Phone #			
Fax #	244-4507	Fax #			

Lab Number:

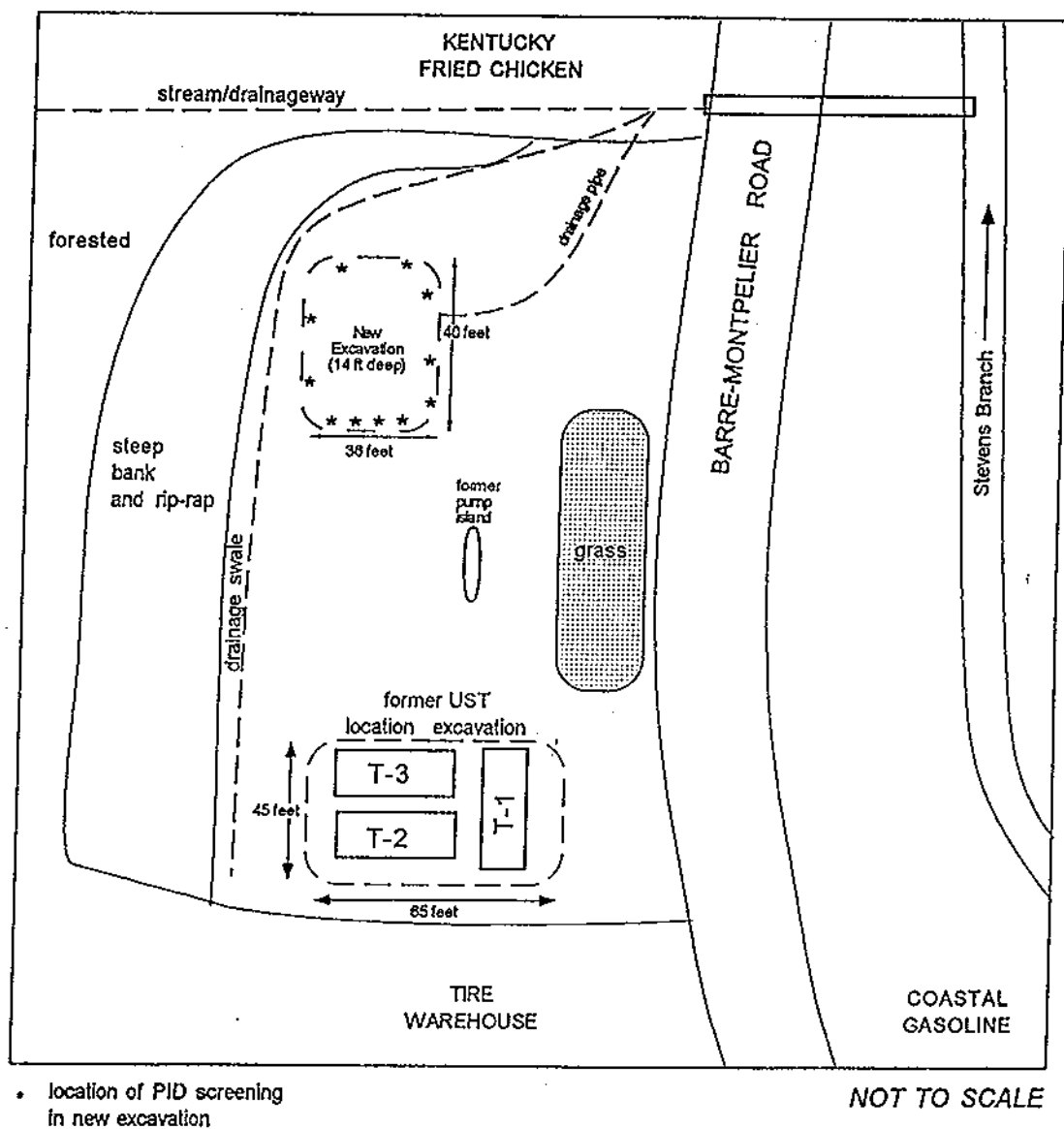


FIGURE 1
Site sketch showing new excavation for re-located USTs,
Barre Mobil Short Stop, Berlin, VT

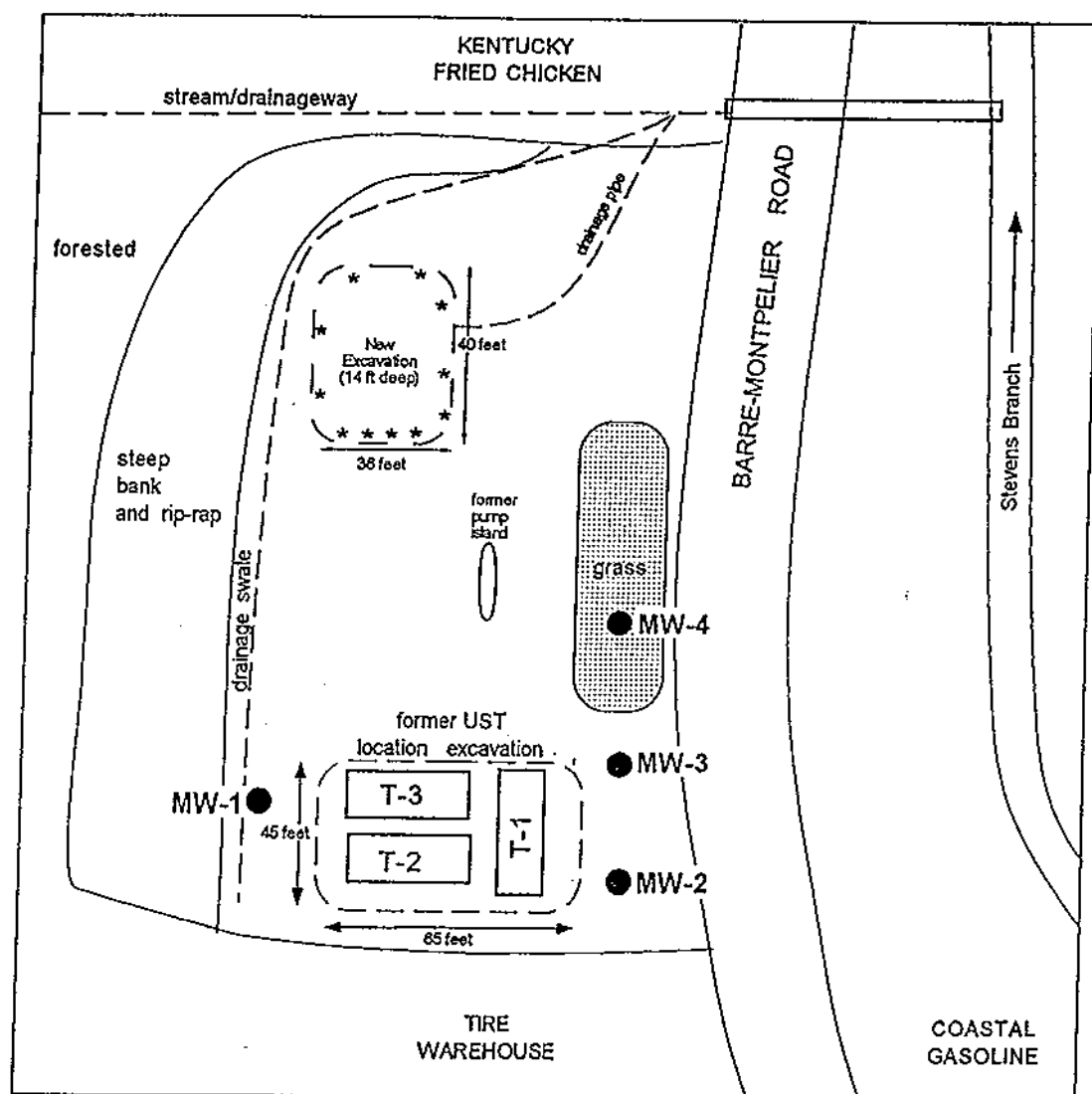


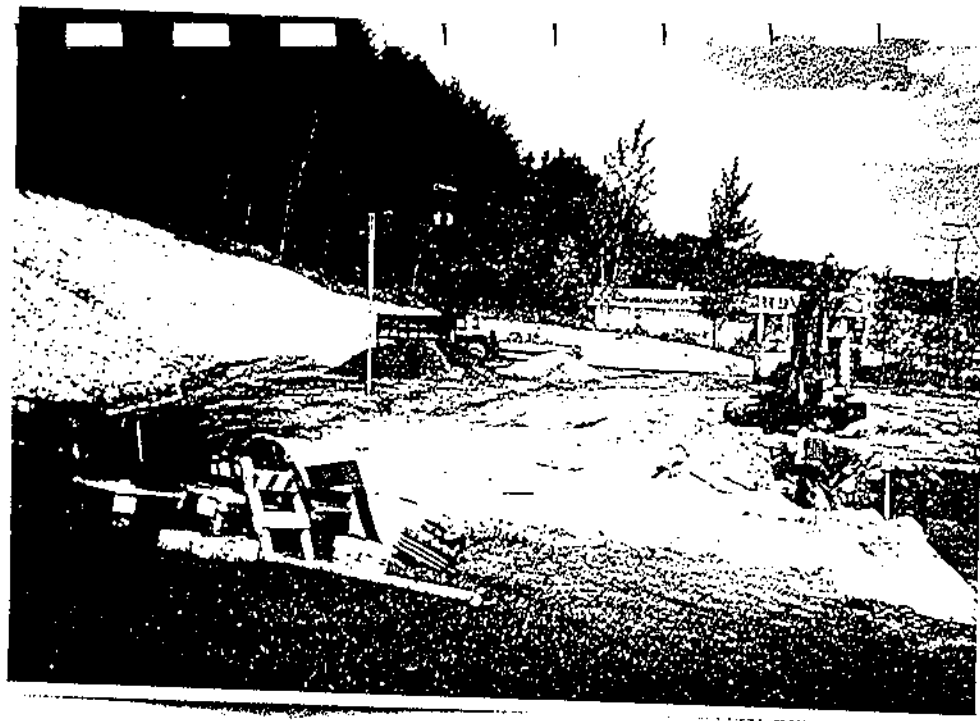
FIGURE 2
Site sketch with proposed monitoring well locations,
Barre Mobil Short Stop, Berlin, VT

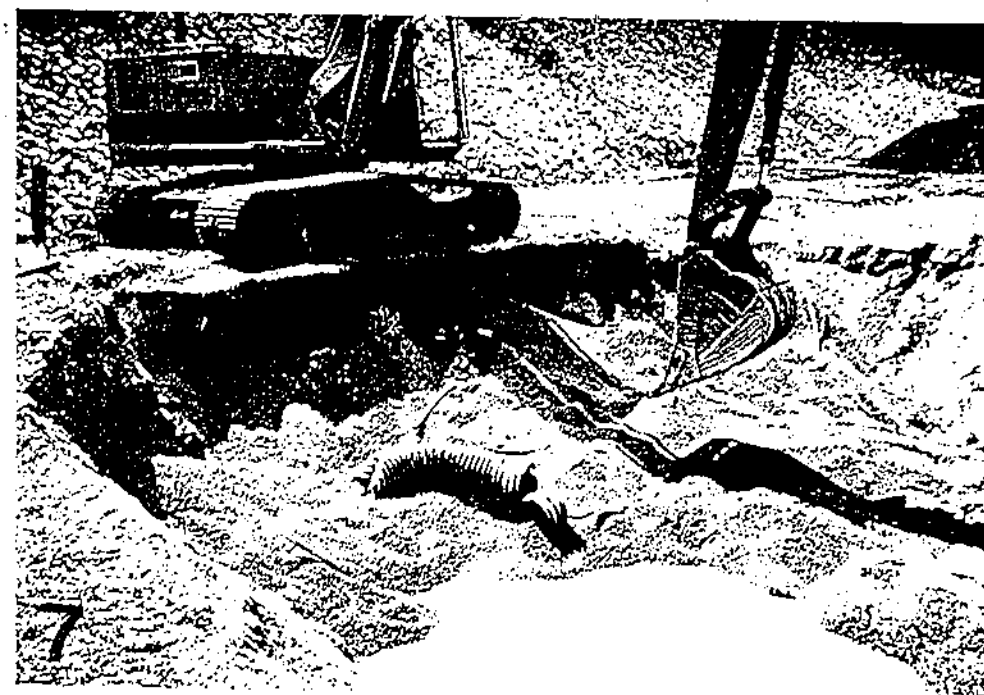
PHOTO LOG

**S.B. Collins' Barre Mobil Short Stop, Barre-Montpelier Road, Berlin, VT
Facility ID 0000811**

USTs Excavated on July 29, 1994

- 1 - View looking north of western portion of site.
- 2 - View looking north of eastern portion of site. The top of tank T1 is exposed, note water in pit.
- 3 - Excavation pit after removal of tank T1.
- 4 - Excavation pit after removal of all three tanks, view looking east.
- 5 - Excavation pit after removal of all three tanks, view looking north.
- 6 - Excavation pit after removal of all three tanks, view looking northeast.
- 7 - Excavation pit after removal of all three tanks, view looking west.
- 8 - View of trench dug on northern perimeter of site, note gray till and lack of water.





August 2, 1994

Carl Ruprecht, UST Manager
S.B. Collins, Inc.
54 Lower Welden Street
St. Albans, VT 05478

Re: Site Assessment, Barre Mobil Short Stop, Berlin, VT
(Facility ID #0000811)

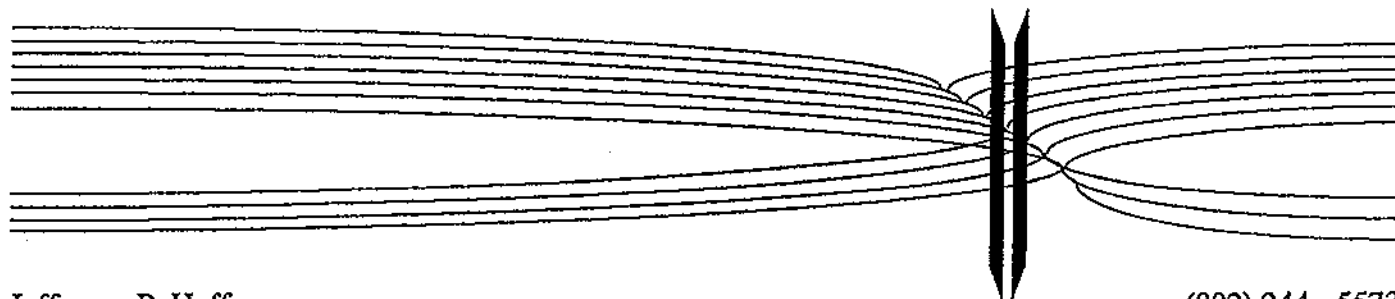
Dear Carl:

This letter presents a site assessment for the July 29, 1994 excavation of three underground storage tanks (USTs) at S.B. Collins' Barre Mobil Short Stop, located on the Barre-Montpelier Road in Berlin (see Figure 1). The tanks were being relocated at the site to allow the installation of a canopy. The three 12,000-gallon double-contained tanks were originally installed at the site in August, 1989, when the site was owned by Highway Oil, Inc.

SITE DESCRIPTION

The site is located on the Barre-Montpelier Road, and is bordered to the north by Kentucky Fried Chicken, and to the south by the Tire Warehouse. The Stevens Branch of the Winooski River is located east of the site, on the other side of the Barre-Montpelier Road. A Coastal gasoline station is also located across the Barre-Montpelier Road, southeast of the site.

The site is fairly level and is situated on the terrace of the Stevens Branch. A steep embankment is present on the western side of the site. The embankment is covered with rip-rap, which was apparently placed to reduce erosion. Elevation at the site is approximately 650 feet above mean sea level. The channel of the Stevens Branch is a few hundred feet east of the site, and is approximately 10 to 15 lower in elevation than the site.



Jefferson P. Hoffer
Consulting Hydrogeologists

(802) 244 - 5573
P.O. Box 428, Waterbury, Vermont 05676

According to Stewart's (1971) surficial geologic map of the region, the site is underlain by lacustrine silts and clays. Based on the topography and site setting, shallow groundwater flow within these unconsolidated sediments is likely eastward toward Stevens Branch. The underlying bedrock is mapped as the Barton Member of the Waits River Formation, an interbedded unit of phyllite and siliceous limestone (Doll, 1961). Since the site is within the Stevens Branch valley, with a steep increase in elevation to the west, the area is probably a discharge zone for groundwater within the underlying bedrock (i.e., flow is upward into the unconsolidated sediments and Stevens Branch).

A review of the Vermont Hazardous Sites Lists indicates that the nearest site under investigation is Rossi Buick, which is located about 1000 feet southeast of the site.

TANK EXCAVATIONS

Figure 2 presents a site sketch illustrating the UST locations prior to their excavation. Shallow perched groundwater was encountered about two feet below grade. The backfill surrounding the USTs consisted of pea-sized medium gravel. Surrounding soils exposed during the UST excavations included a brown silt, and cobbly sand and gravel. Much of the brown sand and gravel material appeared to be fill material.

When the USTs were removed, the gravel backfill cascaded into and filled the excavations. The tanks appeared virtually brand new with little or no signs of weathering.

Photoionization detector (PID) readings were taken with an HNU calibrated to benzene. The PID was utilized to obtain vapor readings emanating from soils along the sidewalls and in the backfill gravel. PID readings are presented on Figure 3. In general, PID readings along the sidewalls were less than 2 ppm. Some elevated readings were detected beneath the piping runs, with a maximum reading of 15 ppm detected in gravel fill. On the eastern sidewall, a maximum reading of 9 ppm was detected in saturated gravels at a depth of 3 to 3.5 feet. A reading of 5 ppm was detected in wet silt at this location at a depth of 5 feet.

Readings in the 5 to 25 ppm range were detected in the saturated gravel in the bottom of the excavation after the USTs had been removed. A headspace measurement of 10 ppm was obtained on a water sample collected from the excavation pit. A grab water sample was collected at this location. The sample was submitted to Scitest Laboratory Services, Randolph, Vermont, for BTEX/MTBE analysis using EPA Method 8020.

POTENTIAL RECEPTORS

The northward-flowing Stevens Branch is located a few hundred feet from the site. The shallow groundwater encountered at the site likely flows toward to and discharges into Stevens Branch. A small stream flows along the northern boundary of the site, and originates at a higher elevation to the west. Flow from this stream is directed through a

culvert pipe under the Barre-Montpelier Road into Stevens Branch. Surface water at the site is also directed toward this culvert.

The vicinity is serviced by municipal water and sewer. The State's water well inventory was reviewed to identify nearby wells. Wells identified within a half mile radius of the site are shown on Figure 4. Relevant information for these wells is as follows;

Well No.	Owner	Yield (gpm)	Total Depth (ft)	Depth to Rock (ft)	Static Level
6	Fernando Saldi	8	310	130	Flowing
13	Josephine Trombley	40	120	16	20
59	Amcare	60	190	2	Flowing
60	Amcare	60	175	170	Flowing
61	Amcare	65	500	136	Flowing
87	Electrical Wholesale Inc	4	100	30	Flowing
194	Osvaldi Ciampi	50	415	50	90
280	Blue Cross	7	85	0	21
322	H.D. Huntington	20	98	49	
407	Vincent Illuzzi	20	190	49	18
408	Larry Rossi	30	190	38	10
457	Richard Diego	3	300	5	

All of these wells are completed in bedrock. The closest well to the site is #87, which is owned by Electrical Wholesalers. The well log indicates a 30 foot depth to bedrock and artesian flow. Depth to bedrock for the wells in a similar hydrogeologic setting (#s 6, 87, 407, and 408) as the site range from 30 to 130 feet. Based on this information, it is extremely unlikely that shallow groundwater at the site could reach these wells.

Slightly elevated PID readings of soil and water headspaces suggest that shallow groundwater contains dissolved petroleum hydrocarbons. However, PID readings were not high enough to indicate that a potential problem involving vapor migration exists at the site. In addition, none of the neighboring properties appear to have basements.

SUMMARY

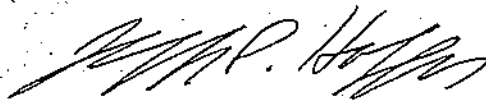
Three 12,000-gallon USTs were excavated and removed on July 29, 1994 at the Barre Mobil Short Stop in Berlin, Vermont. The tanks had been installed in August, 1989, and appeared to be in excellent condition when removed on July 29, 1994.

Slightly elevated PID readings of soil and water headspaces suggest that shallow groundwater, which was encountered at two feet below grade, contains dissolved petroleum hydrocarbons. A sample of the shallow groundwater was collected from the excavation pit and was submitted for laboratory analysis.

The laboratory results, as well as photographs taken during the UST excavations, should be available within two weeks. At that time, any recommendations concerning further investigatory efforts at this site will be presented.

If you have any questions concerning this information, please call me.

Sincerely,



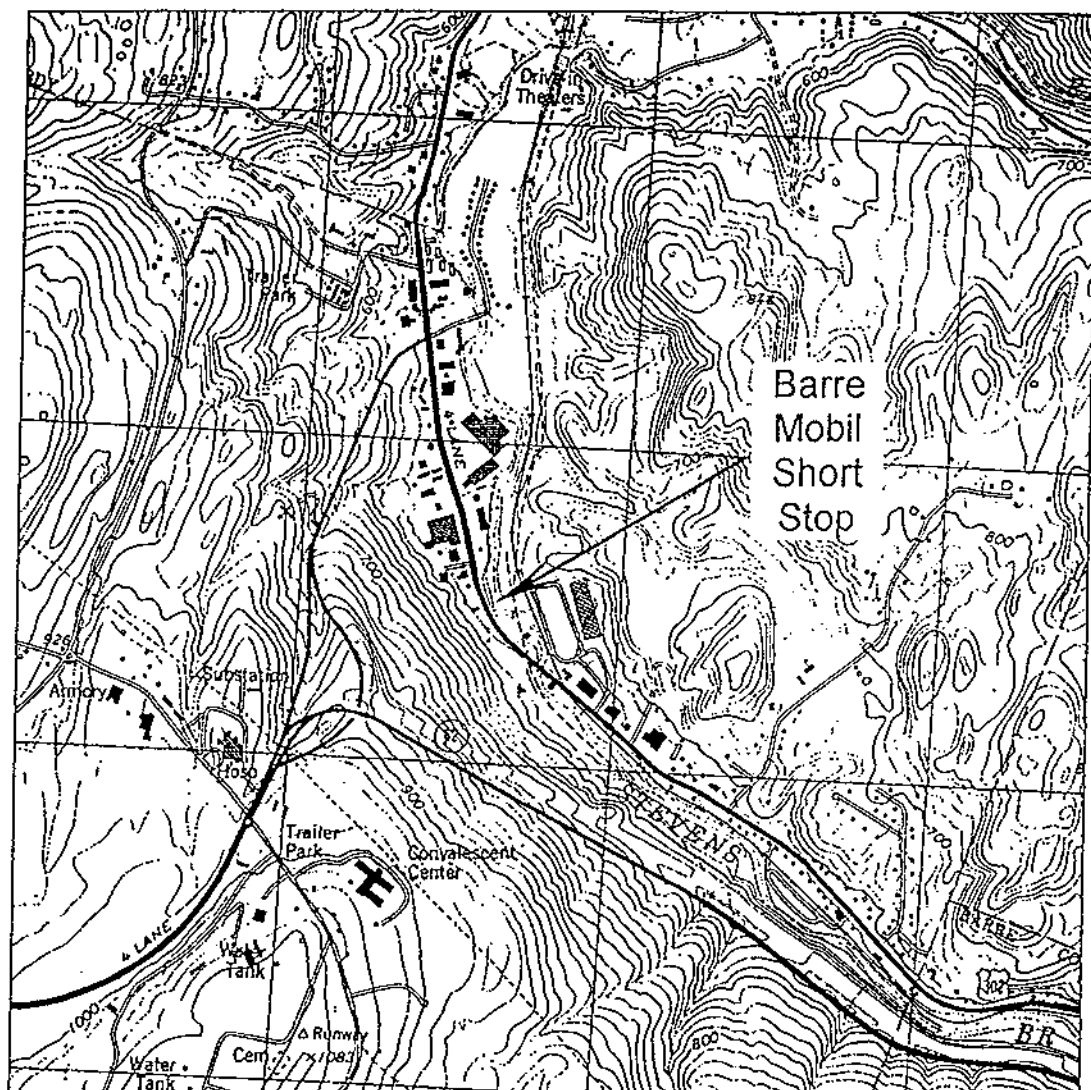
Jefferson P. Hoffer
Principal Hydrogeologist

enc.

REFERENCES

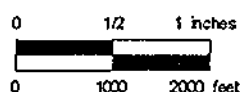
Doll, C.G. (Ed.), 1961, Centennial Geologic Map of Vermont, Vermont Geological Survey.

Stewart, D.P., 1971, Geology for Environmental Planning in the Barre-Montpelier Region, Vermont, Vermont Geological Survey, Environmental Geology No. 1.



Base from U.S. Geological Survey,
1:24,000; Barre West, VT, 1978,
Photorevised 1988

SCALE 1:24 000



Elevations in feet above mean sea
level, contour interval 20 feet

FIGURE 1
Site location map, Barre Mobil Short Stop, Berlin, VT

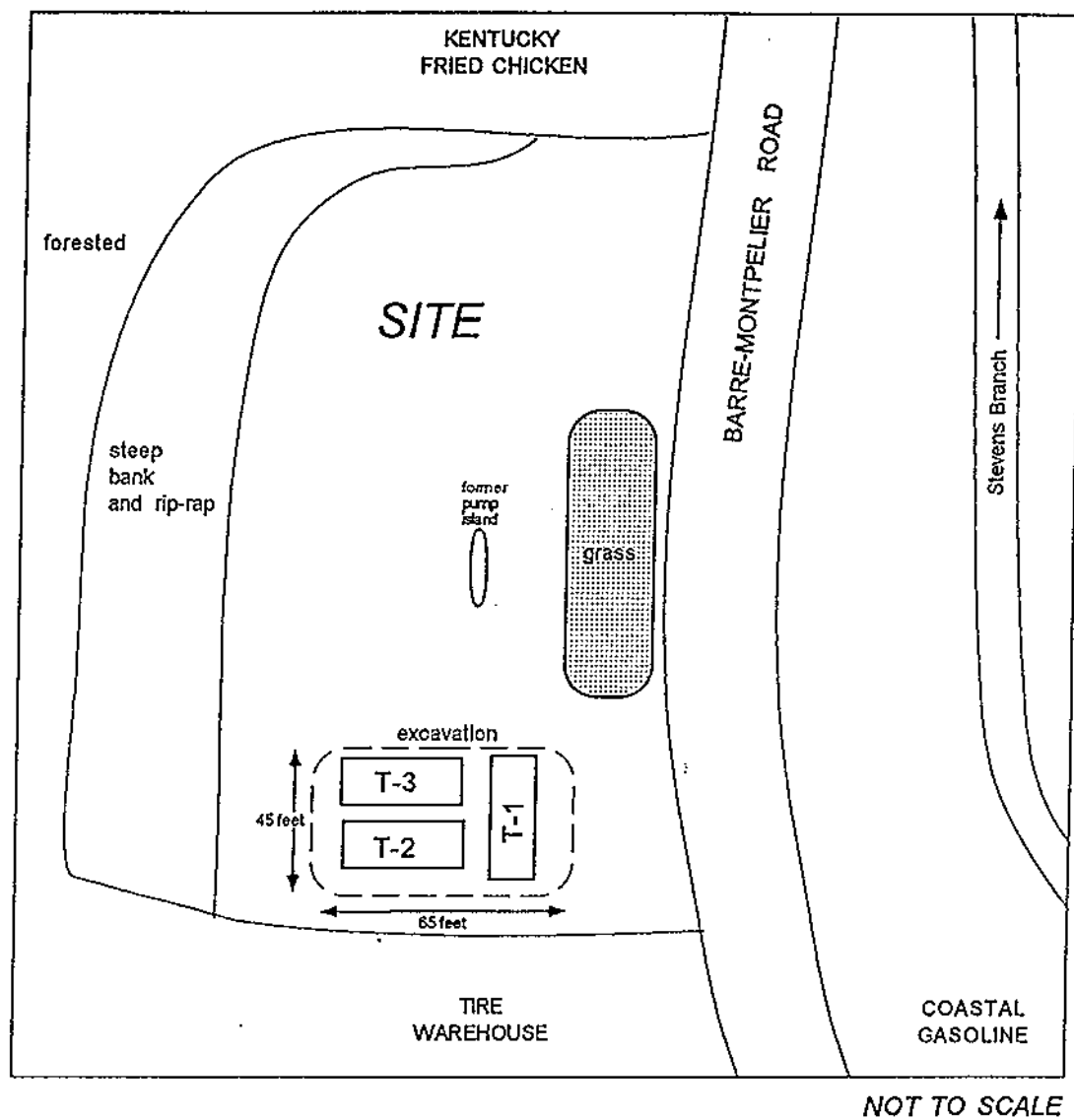


FIGURE 2
Site sketch, Barre Mobil Short Stop, Berlin, VT

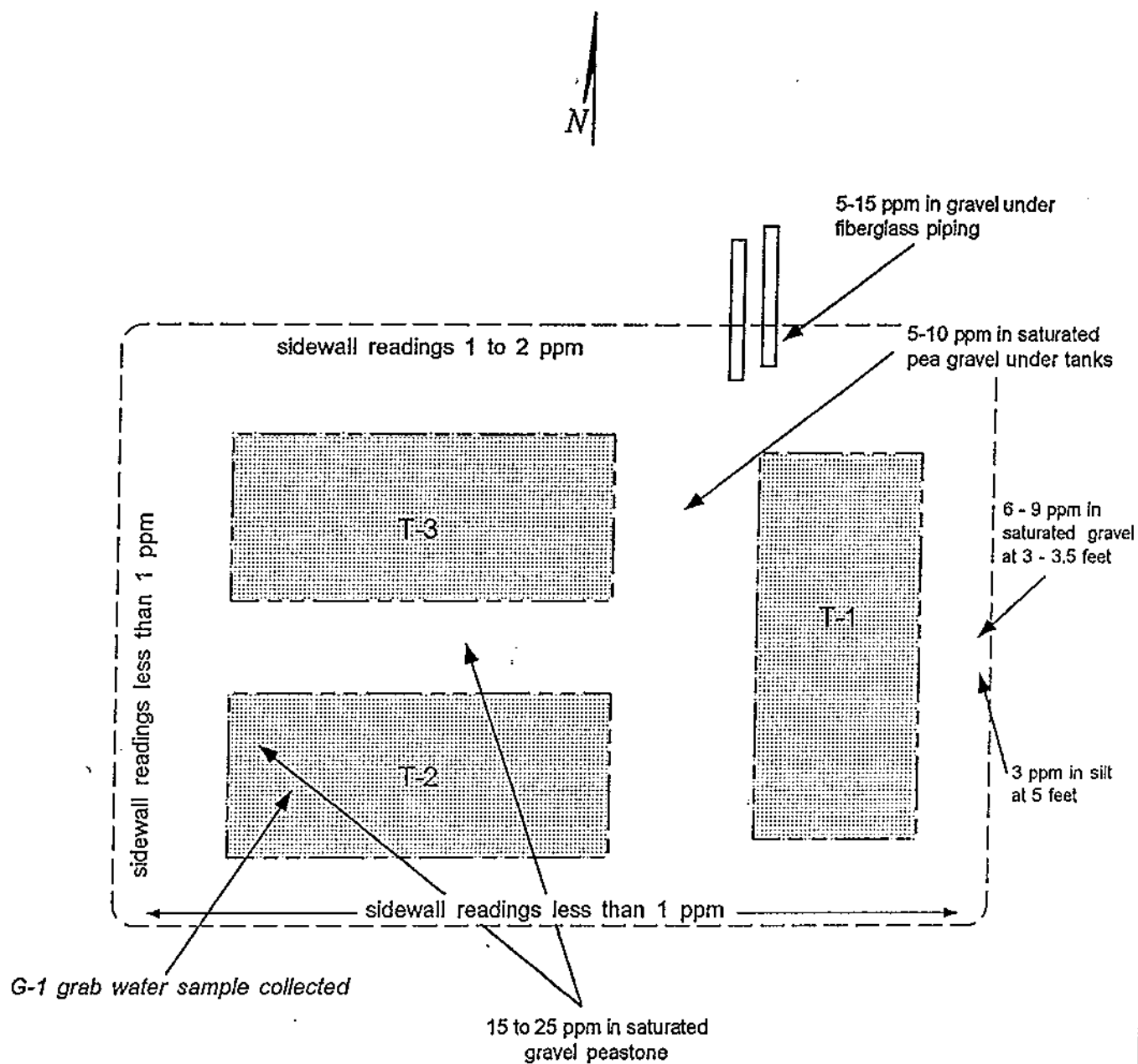
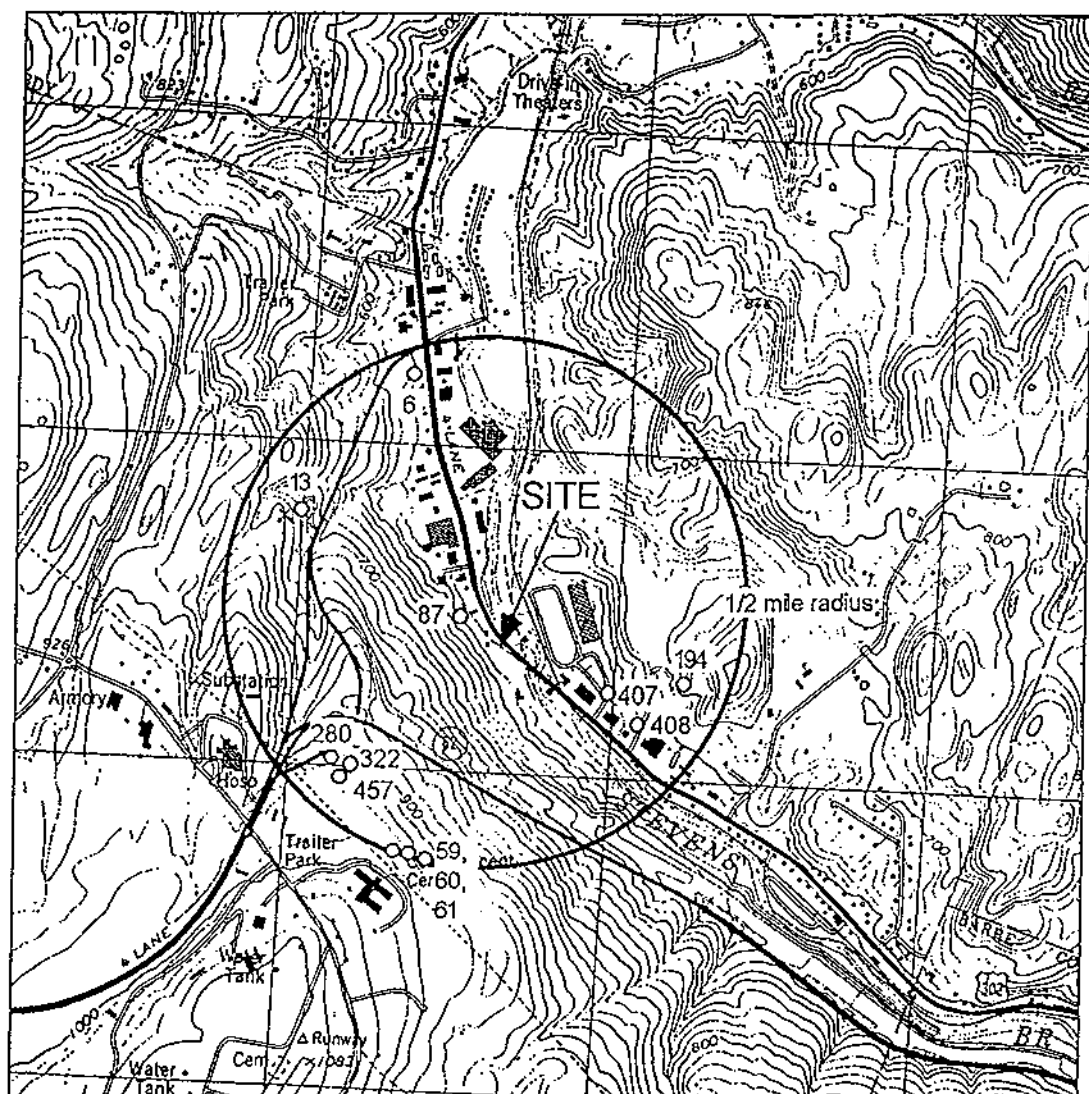
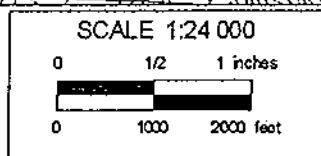


FIGURE 3
Sketch of UST excavations and PID readings
(HNU calibrated to benzene), Barre Mobil Short Stop, Berlin, VT



Base from U.S. Geological Survey,
1:24,000; Barre West, VT, 1978,
Photorevised 1988



Elevations in feet above mean sea
level, contour interval 20 feet.
Well locations from the VT DEC
Water Supply Section - locations
are not field verified

○407 Well Location,
Water Resources Well #

FIGURE 4
Water supply wells within 1/2-mile radius,
Barre Mobil Short Stop, Berlin, VT

APPENDIX B
Monitoring Well Logs

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

Well/Boring ID: MW-3

Project Name: SBC/Barre Mobil SS Site: Barre/Mtpelier Road, Berlin, VT Project Number: 04-11 Driller: Adams Engineering Drilling Method: 2 3/8-inch drive tube Geologist: J. Hoffer Sampling Method: 2 3/8-inch drive tube Date/Time Started: 11/4/94 Date/Time Completed: 11/4/94 Weather: 50 degrees, overcast	WELL CONSTRUCTION Total Depth Drilled: 15.5' BGS Screen Type/Interval: 1.5" PVC, 10-slot from 2.5 to 12.5' BGS Sandpack Type/Interval: m sand, 1.5 - 12.5' BGS Riser Type/Interval: 1.5" PVC from 0-2.5' BGS Seal Type/Interval: bentonite slurry, 0.5 - 1.5 Water Level/Date/Time: 11/5/94, 8.39 Elevation of Top of PVC: 100.24 feet, relative to on-site benchmark Well Development: peristaltic, pumped for 30 mins Surface conditions: grass
---	---

Driven Interval (feet BGS)	Total Driven/ Recovery (feet)	Recovered Interval (feet)	Approx. Interval (feet BGS)	Sample Description (color, texture, etc.)	PID* Reading (ppm)
1.5 - 5.2	3.7/3.0	0 - 1.0	1.5 - 2.5	brown sand (m/c) and gravel (f)	17.0
		1 - 1.5	2.5 - 3.0	brown silty sand	0.1
		1.5 - 2.5	3.0 - 4.0	yellow-brown sand (f/m), dry	0.1
		2.5 - 3.0	4.0 - 5.0	gray silty fine sand, wet	0.1
5.5 - 10.5	5.0/3.0	0 - 2.5	5.5 - 9.0	olive-brown silty fine sand, wet	1.3
		2.5 - 3.0	9.0 - 10.0	grayish brown medium sand and silty sand, wet, some RF	40.0
10.5 - 13.4 (refusal)	2.9/2.9	0 - 2.0	10.5 - 12.5	medium sand and silty sand, some black staining	2
		2.0 - 2.9	12.5 - 13.4	light brown silty fine sand, wet	0.1

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

0 - 4.0' brown sand and silty sand, dry

4.0 - 13.4' gray silty fine sand, sand, wet, some black staining, low PID readings

13.4'+ unweathered till?

NOTES:

* Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene

BGS - Below Ground Surface, BTOC - Below Top of Casing, f - fine, m - medium, c - coarse, RF = rock fragment

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

Well/Boring ID: MW-2

Project Name: SBC/Barre Mobil SS	WELL CONSTRUCTION
Site: Barre/Mtpeleir Road, Berlin, VT	Total Depth Drilled: 15.5' BGS
Project Number: 04-11	Screen Type/Interval: 1.5" PVC, 10-slot from 2.5 to 12.5' BGS
Driller: Adams Engineering	Sandpack Type/Interval: m sand, 1.5 - 12.5' BGS
Drilling Method: 2 3/8-inch drive tube	Riser Type/Interval: 1.5" PVC from 0-2.5' BGS
Geologist: J. Hoffer	Seal Type/Interval: bentonite slurry, 0.5 - 1.5
Sampling Method: 2 3/8-inch drive tube	Water Level/Date/Time: 11/5/94, 8.65' (no measureable free product)
Date/Time Started: 11/4/94	Elevation of Top of PVC: 100.02 feet, relative to on-site benchmark
Date/Time Completed: 11/4/94	Well Development: peristaltic, pumped 2.5 gallons (0.05 gal free product)
Weather: 50 degrees, overcast	Surface conditions: grass

Driven Interval (feet BGS)	Total Driven/ Recovery (feet)	Recovered Interval (feet)	Approx. Interval (feet BGS)	Sample Description (color, texture, etc.)	PID* Reading (ppm)
1.5 - 4.0	2.5/2.0	0 - 2.0	1.5 - 4.0	grayish brown silty fine sand, 20% rounded gravel (m/c), dry, firm	1.4
5.5 - 10.5	5.0/4.0	0 - 4.0	5.5 - 10.5	gray brown silty sand, 5% rounded gravel, saturated, petroleum sheen in soil/water shake sample	>2500
10.5 - 15.5	4.0/4.0	0 - 3.0	10.5 - 13.5	gray fine sand and silty sand, saturated, soft	1850
		3.0 - 4.0	13.5 - 14.5	silty sand, black-stained in portions, sheen visible	
		4.0 - 5.0	14.5 - 15.5	as above with more RF (5 - 10%) tip of sampler - dense till	

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

0 - 4.0' brown silty fine sand, some gravel

4.0 - 14.5' silty sand, saturated, soft, with black staining and free-phase product

14.5 - 15.5' unweathered till?

NOTES:

* Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene

BGS - Below Ground Surface, BTOC - Below Top of Casing, f - fine, m - medium, c - coarse, RF = rock fragment

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

Well/Boring ID: MW-1

Project Name: SBC/Barre Mobil SS	WELL CONSTRUCTION
Site: Barre/Mtpelier Road, Berlin, VT	Total Depth Drilled: 15.6' BGS
Project Number: 04-11	Screen Type/Interval: 1.5" PVC, 10-slot from 2.5 to 12.5' BGS
Driller: Adams Engineering	Sandpack Type/Interval: m sand, 1.5 - 12.5' BGS
Drilling Method: 2 3/8-inch drive tube	Riser Type/Interval: 1.5" PVC from 0-2.5' BGS
Geologist: J. Hoffer	Seal Type/Interval: bentonite slurry, 0.5 - 1.5
Sampling Method: 2 3/8-inch drive tube	Water Level/Date/Time: 11/5/94, 5.38'
Date/Time Started: 11/4/94	Elevation of Top of PVC: 105.28 feet, relative to on-site benchmark
Date/Time Completed: 11/4/94	Well Development: peristaltic, pumped for 30 mins
Weather: 50 degrees, overcast	Surface conditions: grass

Driven Interval (feet BGS)	Total Driven/ Recovery (feet)	Recovered Interval (feet)	Approx. Interval (feet BGS)	Sample Description (color, texture, etc.)	PID* Reading (ppm)
1.5 - 5.6	4.1/3.0	0 - 1.0	1.5 - 2.5	light brown medium sand/fine gravel, dry	0.3
		1.0 - 2.0	2.5 - 5.6	light grayish brown silt, wet	0.2
5.6 - 10.6	5.0/4.0	0 - 1.2	5.6 - 6.8	as above	0.2
		1.2 - 4.0	6.8 - 10.6	brown silty sand (m), pebbles, RF, wet, firm	0.4
10.6 - 15.6	5.0/3.0	0 - 3.0	10.6 - 15.6	olive-brown fine sand and silt, some medium sand, wet, soft non-cohesive, 5% weathered RF (less than above)	0.2

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

- 0 - 2.5' brown m/c sand and fine gravel topsoil/fill
- 2.5 - 6.8' gray brown silt
- 6.8 - 10.6' silty sand w/ pebbles, firm, saturated
- 10.6 - 15.6+ fine sand and silt, soft, saturated

NOTES:

* Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene

BGS - Below Ground Surface, BTOC - Below Top of Casing, f - fine, m - medium, c - coarse, RF = rock fragment

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

Well/Boring ID: MW-4

Project Name: SBC/Barre Mobil SS	WELL CONSTRUCTION
Site: Barre/Mtpelier Road, Berlin, VT	Total Depth Drilled: 15.5' BGS
Project Number: 04-11	Screen Type/Interval: 1.5" PVC, 10-slot from 2.5 to 12.5' BGS
Driller: Adams Engineering	Sandpack Type/Interval: m sand, 1.5 - 12.5' BGS
Drilling Method: 2 3/8-inch drive tube	Riser Type/Interval: 1.5" PVC from 0-2.5' BGS
Geologist: J. Hoffer	Seal Type/Interval: bentonite slurry, 0.5 - 1.5
Sampling Method: 2 3/8-inch drive tube	Water Level/Date/Time: 11/5/94, 10.09' BTOC
Date/Time Started: 11/4/94	Elevation of Top of PVC: 99.55 feet, relative to on-site benchmark
Date/Time Completed: 11/4/94	Well Development: peristaltic, pumped for 30 mins
Weather: 50 degrees, overcast	Surface conditions: grass

Driven Interval (feet BGS)	Total Driven/ Recovery (feet)	Recovered Interval (feet)	Approx. Interval (feet BGS)	Sample Description (color, texture, etc.)	PID* Reading (ppm)
1.5 - 5.5	4.0/3.4	0 - 1.0	1.5 - 2.5	brown loamy sand	2.0
		1.0 - 2.0	2.5 - 3.5	gray silt with fine sand, somewhat dense,	2.0
		2.0 - 3.4	3.5 - 5.0	as above, but moist	60
5.5 - 10.5	5.0/4.0	0 - 4	5.5 - 10.5	gray brown silty fine sand, some medium sand lenses, firm 10% sub-angular gravel/cobble, some black staining	829
10.5 - 15.5 (hard at 14.5)	5.0/5.0	0 - 2.0	10.5 - 12.5	gray brown silty fine sand, 10-20% gravel	1688
		2.0 - 4.0	12.5 - 14.5	gray silty fine sand, some fine sand, soft	120
		4.0 - 5.0	14.5 - 15.5	gray silty sand, firm, moist	138.0

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

0 - 2.5' brown loamy sand (fill)

2.5 - 14.5' gray silty fine sand, sand, some gravel, some black staining

14.5-15.5'+ unweathered till?

NOTES:

* Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene

BGS - Below Ground Surface, BTOC - Below Top of Casing, f - fine, m - medium, c - coarse, RF = rock fragment

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

Well/Boring ID: MW-5

Project Name: SBC/Berlin Mobil SS Site: Barre/Mtpelier Road, Berlin, VT Project Number: 04-11 Driller: Tri-State Drilling & Boring Drilling Method: 6" ODEX Geologist: T.Schmalz Sampling Method: cuttings Date/Time Started: 2/9/95, 1020 Date/Time Completed: 2/9/95 1110	WELL CONSTRUCTION Total Depth Drilled: 20.0' BGS Screen Type/Interval: 2" PVC, 10-slot from 9.5 - 19.5' BGS Sandpack Type/Interval: m sand, 4.9 - 20' BGS Riser Type/Interval: 2" PVC from 0-9.5' BGS Seal Type/Interval: bentonite gravel, 4.0 - 4.9' BGS Water Level/Date/Time: 2/14/95, 14.94' BTOC Elevation of Top of PVC: 94.39
---	---

DEPTH INTERVAL (BGS)	DESCRIPTION	PID HEADSPACE (ppm)
0 - 5.0'	Dark brown m/c sand (75%), silt (15%), sub-rounded gravel (10%)	0
5 - 6.5'	Granite boulders (fill)	0
6.5 - 9.0'	same as from 0 - 5.0'	
9.0 - 20.0'	sandy silt, angular shale fragments, moist (15-20% sand, 35% silt, 45% rock fragments), becoming v.moist at 19-20.0'	11' = 5.2 20' = 0.8

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

- 0 - 5.0' fill - silt and sand, dry
- 5.0-6.5' Granite boulders (fill), dry
- 6.5-9.0' fill/till? - silt and sand, dry
- 9.0-20.0' till? - sandy silt with angular shale fragments, moist, v.moist at 19-20.0'

NOTES:

* Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene

BGS - Below Ground Surface, BTOC - Below Top of Casing, f - fine, m - medium, c - coarse, RF = rock fragment

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

Well/Boring ID: MW-6

Project Name: SBC/Berlin Mobil SS Site: Barre/Mtpepier Road, Berlin, VT Project Number: 04-11 Driller: Tri-State Drilling & Boring Drilling Method: 6" ODEX Geologist: T.Schmalz Sampling Method: cuttings Date/Time Started: 2/9/95, 1315 Date/Time Completed: 2/9/95 1348	WELL CONSTRUCTION Total Depth Drilled: 20.0' BGS Screen Type/Interval: 2" PVC, 10-slot from 9.0 - 19.0' BGS Sandpack Type/Interval: m sand, 7.0 - 20' BGS Riser Type/Interval: 2" PVC from 0-9.0' BGS Seal Type/Interval: bentonite gravel, 4.0 - 7.0' BGS Water Level/Date/Time: 2/14/95, 14.51' BTOC Elevation of Top of PVC: 93.94
---	---

DEPTH INTERVAL (BGS)	DESCRIPTION	PID HEADSPACE (ppm)
0 - 5.0'	silty sand	
5 - 8'	granite boulders (fill)	7.5' = 1.6
8 - 14'	Dark brown gray sandy silt with angular gravel, s. moist	14' = 1.9
14 - 20'	Brown silty sand (65% silt, 35% m/c sand), moist wet at 17'	17' = 2.3 20' = 2.1

GENERALIZED GEOLOGIC LOG and OTHER OBSERVATIONS

- 0 - 5.0' fill - silt and sand, dry
- 5.0 - 8' Granite boulders (fill), dry
- 8 - 14' till? - silt and sand, with elongate gravel, moist
- 14 - 20' till? - silty sand, moist, wet at 17'

NOTES:

* Peak Headspace Reading, Photovac MicroTIP HL-2000, calibrated to isobutylene

BGS - Below Ground Surface, BTOC - Below Top of Casing, f - fine, m - medium, c - coarse, RF = rock fragment

ADAMS ENGINEERING
Gerard Adams
RD #1, Box #3700, Underhill, VT 05489

November 5, 1994

Mr. Jeff Hoffer
Jefferson P. Hoffer, Hydrogeologist

Well Logs: Berlin Short Stop.

Manways cemented in place drilled with 10" auger with 4" pilot to -1.5'; sampled with polyethylene (PE) lined 5' X 2.375" ID NQ vibrated to depth, pulled & sample vibrated from casing in PE liner for examination; well with slip cap to created annulus & sandpack vibrated to depth in open 2.75" borehole left by sampler; bentonite slurry placed in open hole. Well developed with peristaltic pump using dedicated PE suction hose.

MW #1, 11/4/94

SOILS WELL

- G. Manways in packed native soil backfill (S.B. Collins), typ.
 - 1' Top Bentonite slurry.
 - 1.3' Bottom bentonite top sand pack.
 - 1.5 > 5.6' Moist gray silty fine sand.
 - 2.5' Top well screen, 10', typ.
 - 5.6 > 10.6' Same saturated pieces of shale.
 - 12.5' Bottom screen, typ.
 - 10.6 > 15.0' Same.
- Developed clean fair recovery.

MW #2

- G. Manway.
 - 1' Top Bentonite slurry.
 - 1.5' Bottom bentonite top sand pack.
 - 1.5 > 4' Refusal, rocks, gray silty fine sand & stones, tried small sampler unsuccessfully, augered to -5'.
 - 2.5' Top well screen, 10', typ.
 - 5.5 > 10.5' Brown silty fine sand with significant saturated black sandy zones smells of gasoline.
 - 12.5' Bottom screen, typ.
 - 10.5 > 14.5' Same, terminated in tough dense gray silty fine sand, typ.
- Developed clean fair recovery. recovered some weathered gasoline.

MW #3

- G. Manway.
 - 1' Top Bentonite slurry.
 - 1.5' Bottom bentonite top sand pack.
 - 1.5 > 5.5' Brown damp silty fine sand.
 - 2.5' Top well screen, 10', typ.
 - 5.5 > 10.5' Brown silty fine sand with few saturated black sandy zones slight smell of gasoline.
 - 12.5' Bottom screen, typ.
 - 10.5 > 14.5' Same, terminated in tough dense gray silty fine sand.
- Developed clean fair recovery.

MW #4

- G. Manway.
 - 1' Top Bentonite slurry.
 - 1.3' Bottom bentonite top sand pack.
 - 1.5 > 5.5' Refusal, rocks, gray silty fine sand & stones, tried small sampler unsuccessfully, augered to -5'.
 - 2.5' Top well screen, 10', typ.
 - 5.5 > 10.5' Brown silty fine sand with few saturated black sandy.
 - 12.5' Bottom screen, typ.
 - 10.5 > 14.5' Same, terminated in tough dense gray silty fine sand, typ.
- Developed clean poor recovery.

G. Adams

G. Adams

SOIL PROBE LOG

Page 1 of 2

MW # 5

Mobil Short Stop
Berlin, VT

TRI STATE
DRILLING & BORING, INC.

RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

		SAMPLER	SOIL
		Continuous	Saturated
TYPE	_____		Wet
SIZE	_____		Moist
HAMMER	_____		Damp
FALL	_____		Slightly Damp

DATE STARTED: 02/09/95

DATE COMPLETED: 02/09/95

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

6" Odex to 20'.

Sandy gravel fill.

Coarse boulders, granite chunks.

Olive brown till, silty sand and gravel,
strong gas smell, moist.

Screen 19' to 9' below GS.

Riser 9' to GS.

Sand 19' to 4'10" below GS.

Bentonite 4'10" to 4' below GS.

Fill 4' to GS.

Project: Mobil Short Stop
Job Location: Berlin, VT
Engineer: Jefferson P. Hoffer
Waterbury, VT
Inspector: Tim Schmalz

Driller: Neal S. Faulkner
Helper: Sean G. Hogan
Materials: 10' (10 slot) screen,
10' riser, 1 cap, 1 locking plug,
3 bags sand, 1 bag bentonite, 1 road box.

SOIL PROBE LOG

Page 2 of 2

MW # 6

Mobil Short Stop

Berlin, VT

TRI STATE
DRILLING & BORING, INC.
RFD #2, Box 113 West Burke, VT 05871
(802) 467-3123

	SAMPLER	SOIL
TYPE	Continuous	Saturated
SIZE		Wet
HAMMER		Moist
FALL		Damp
		Slightly Damp

DATE STARTED: 02/09/95

DATE COMPLETED: 02/09/95

FOOTAGE

DEPTH BLOW COUNTS REC

DRILLER'S NOTES & COMMENTS

6 12 18 24

6" Odex to 19'.

Gravelly fill.

Gravel and granite chunks.

Olive brown silty gravel, faint gas odor.

Cuttings were moist.

Screen 19' to 9' below GS.

Riser 9' to GS.

Sand 19' to 7' below GS.

Bentonite 7' to 4' below GS.

Fill 4' to GS.

Project: Mobil Short Stop
Job Location: Berlin, VT
Engineer: Jefferson P. Hoffer
Waterbury, VT
Inspector: Tim Schmalz

Driller: Neal S. Faulkner
Helper: Sean G. Hogan
Materials: 10' (10" slot) screen,
10' riser, 1 cap, 1 locking plug,
3 bags sand, 1 bag bentonite, 1 road box.

APPENDIX C
Chain-of-Custodies, Field Data Sheets & Analytical Reports



LABORATORY REPORT

CLIENT: S.B. Collins, Inc.
ADDRESS: 54 Lower Welden St.
St. Albans, VT 05478

SITE: Berlin Mobil
ATTENTION: Carl Ruprecht

LABORATORY NO: 5-0111
PROJECT NO: 70249
DATE OF SAMPLE: 1/17/95
DATE OF RECEIPT: 1/17/95
DATE OF ANALYSIS: 1/25/95
DATE OF REPORT: 1/31/95

RESULTS

(Results expressed in micrograms per liter (ug/L))

PARAMETER	MW-01	MW-03	MW-04	MW-02	C-101	FB-01	MW-10A	Trip Blank
Methyl Tertiary Butyl Ether	BPQL	148	852	< 200	10	BPQL	153	BPQL
Benzene	BPQL	50	1180	2110	2	BPQL	79	BPQL
Toluene	5	46	604	10100	BPQL	BPQL	32	BPQL
Ethylbenzene	BPQL	202	792	2880	1	BPQL	278	BPQL
Total Xylenes	BPQL	380	4450	21500	BPQL	BPQL	492	BPQL
Chlorobenzene	BPQL	BPQL	< 50	< 200	BPQL	BPQL	< 20	BPQL
1,2-Dichlorobenzene	BPQL	BPQL	< 50	< 200	BPQL	BPQL	< 20	BPQL
1,3-Dichlorobenzene	BPQL	BPQL	< 50	< 200	BPQL	BPQL	< 20	BPQL
1,4-Dichlorobenzene	BPQL	BPQL	< 50	< 200	BPQL	BPQL	< 20	BPQL

EPA Method 8020

BPQL = Below Practical Quantitation Limit, 1 ppb

c: Hoffer & Associates

Respectfully submitted,

SCITEST, INC.


Roderick J. Lamothe
Laboratory Director

Page 1 of 1

② SAMPLE FROM CULVERT DISCHG. INTO WINOOSKI RIVER ON E SIDE OF VT RT 302

BILL TO: CARL KUPRECHT, JR.
SE. WILSON, VT
54 LOWER WELDEN ST.
ST. ALBANS, VT 05478

COPY OF RESULTS TO: HOFFER + ASSOC.
(As Below)

Scitest, Inc.

P.O. Box 339

Route 66 Professional Center, Randolph, VT 05060

Phone: (802)728-6313 Fax: (802)728-6044

Client: Jeff Hoffer	Address: P.O. Box 428	Project # 70249	Additional Comments or Directions:
Contact: Tim Schmaltz	Waterbury, VT 05676	Phone No:	
Project Name: Berlin Mobil	Date requested: 01/16/95	Requested by: TS/KED	
	Date shipped: 01/16/95		
	Date scheduled: 01/17/95	Rod will deliver.	

CHAIN OF CUSTODY RECORD

	DATE	TIME		DATE	TIME
Sampled By: <i>Timothy J. Donohue</i>			Relinquished By: <i>Timothy J. Donohue</i>	1/17/95	11:45
Accepted By:			Relinquished By: *	*	*
Accepted By:			Received by Scitest: <i>Kathleen Drigan</i>	1/17/95	11:45

Item Nos	Client ID or Description	Sampling Date	Sampling Time	Matrix	Preservative or Label	Bottle Type Plastic/Glass	Container Volume	Bottles per Sample	Parameters and Expiration Time > 7 days
1	MW-01	1/17/95	1000	GW	HCl	G	40 mL	2	EPA 8020
2	MW-03	*	1015	GW	HCl	G	40 mL	2	EPA 8020
3	MW-04	*	1030	GW	HCl	G	40 mL	2	EPA 8020
4	MW-02	*	1045	GW	HCl	G	40 mL	2	EPA 8020
5	C-101	*	1055	GW	HCl	G	40 mL	2	EPA 8020
6	FB-01	*	1100	GW	HCl	G	40 mL	2	EPA 8020
7	MW-10A	*	1115	GW	HCl	G	40 mL	2	EPA 8020
8	Trip Blank	*	0800	GW	HCl	G	40 mL	2	EPA 8020

*Parameters correct as listed Client Initial: *JS*
Please fill in ALL areas marked with an asterisk (*). Thank you.

w:\requests\jeffhoffer\12 9 94.wb1

Report Reviewed By:	Preserve Check:	Project Nos	LABORATORY NUMBER:
Date:		70249	
			LOGIN:



P.O. Box 339
Randolph, Vermont 05060-0339
(802) 728-6313

LABORATORY REPORT

CLIENT: Carl Ruprecht
ADDRESS: SB Collins
54 Lower Welden St.
St. Albans, VT 05478

SITE: Barre Mobil Short Stop
ATTENTION: Carl Ruprecht

LABORATORY NO: 5-0326
PROJECT NO: 70249
DATE OF SAMPLE: 2/14/95
DATE OF RECEIPT: 2/14/95
DATE OF ANALYSIS: 2/22-23/95
DATE OF REPORT: 2/27/95

Results

(Results expressed in micrograms per liter (ug/L))

PARAMETER	MW-05	MW-06	CV-01	TRIP BLANK
Methyl Tertiary Butyl Ether	257	273	17	BPQL
Benzene	387	13	6	BPQL
Toluene	18	BPQL	BPQL	BPQL
Ethylbenzene	169	2	4	BPQL
Total Xylenes	355	13	7	BPQL
Chlorobenzene	< 10	BPQL	BPQL	BPQL
1,2-Dichlorobenzene	< 10	BPQL	BPQL	BPQL
1,3-Dichlorobenzene	< 10	BPQL	BPQL	BPQL
1,4-Dichlorobenzene	< 10	BPQL	BPQL	BPQL
Surrogate % Recovery	100%	98%	100%	100%

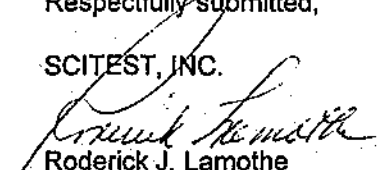
EPA Method 8020

BPQL = Below Practical Quantitation Limit, 1 ppb

cc. Jeff Hoffer

Respectfully submitted,

SCITEST, INC.


Roderick J. Lamothe
Laboratory Director

GROUNDWATER SAMPLING DATA SHEET

LOCATION: BERLIN STREET STOP
DATE: FEB. 14, 1995

SAMPLE METHOD: 2" BAILERS + GRAB 5.
SAMPLING TEAM: T. SCHMALZ

Page 1 of 1[illegible]

* (1.5" = 0.092 gals/ft, 2" = 0.16 gals/ft, 4" = 0.65 gals/ft, 6" = 1.5 gals/ft)

REMARKS

Scitest, Inc.

P.O. Box 339

Route 68 Professional Center, Randolph, VT 05060

Phone: (802)728-6313 Fax: (802)728-8044

Client: Jeff Hoffer

Contact: Tim Schmalz

Address: P.O. Box 428

Waterbury, VT 05676

Project # 70249

Phone No:

Requested by: TSKLG

Additional Comments or Directions:

Project Name: Barre Mobil Short Stop

Date requested: 02/10/95

Date shipped: 02/10/95 with RJL

Date scheduled: Week of 02/13/95

CHAIN OF CUSTODY RECORD

Sampled By:	DATE	TIME	Relinquished By:	DATE	TIME
Timothy Schmalz			Timothy Schmalz	2/14/95	1630
Accepted By:			Relinquished By:		
				*	*
Accepted By:			Received by Scitest:		
			Lin J. Greenwood	2/14/95	4:30 pm

Item Nos	Client ID or Description	Sampling Date	Sampling Time	Matrix	Preservative or Label	Bottle Type	Container Volume	Bottles per Sample	ASAP	Parameters and Expiration Time			
										24 hrs	48 hrs	7days	>7days
1	MW-05	2/14/95	1520	GW	HCl	G	40 mL	2					
2	MW-06		1545	GW	HCl	G	40 mL	2					EPA 8020
3	CU-01		1600	GW	HCl	G	40 mL	2					EPA 8020
				GW	HCl	G	40 mL	2					EPA 8020
5	Trip Blank		1300	GW	HCl	G	40 mL	2					EPA 8020

*Parameters correct as listed Client Initial: _____
Please fill in ALL areas marked with an asterisk (*). Thank you

w:\requests\hoffer\barremob.wb1

Report Reviewed By:	Preserve Check:	Project Nos	LABORATORY NUMBER:
Date:			LOGN:



LABORATORY REPORT

CLIENT: S.B. Collins, Inc.
ADDRESS: 54 Lower Welden St.
St. Albans, VT 05478

ATTENTION: Carl Ruprecht
SITE: Berlin Mobil

LABORATORY NO: 5-0528
PROJECT NO: 70249
DATE OF SAMPLE: 03/8/95
DATE OF RECEIPT: 03/8/95
DATE OF ANALYSIS: 03/9-10/95
DATE OF REPORT: 03/23/95

RESULTS

(Results expressed in micrograms per liter (ug/L))

PARAMETER	MW-01	MW-02	MW-03	MW-04	MW-05	MW-06	CV-01	MW-10A	FIELD BLANK	TRIP BLANK
Methyl Tertiary Butyl Ether	BPQL	288	158	143	257	284	5	299	BPQL	BPQL
Benzene	BPQL	1790	< 10	353	208	17	1	18	BPQL	BPQL
Toluene	1	7200	38	144	19	BPQL	BPQL	BPQL	BPQL	BPQL
Ethylbenzene	BPQL	1640	225	213	150	3	BPQL	2	BPQL	BPQL
Total Xylenes	BPQL	12900	387	1176	354	16	1	13	BPQL	BPQL
BTEX	1	23530	669	1886	731	36	2	33	BPQL	BPQL
Chlorobenzene	BPQL	< 200	< 10	< 20	BPQL	BPQL	BPQL	BPQL	BPQL	BPQL
1,2-Dichlorobenzene	BPQL	< 200	< 10	< 20	BPQL	BPQL	BPQL	BPQL	BPQL	BPQL
1,3-Dichlorobenzene	BPQL	< 200	< 10	< 20	BPQL	BPQL	BPQL	BPQL	BPQL	BPQL
1,4-Dichlorobenzene	BPQL	< 200	< 10	< 20	BPQL	BPQL	BPQL	BPQL	BPQL	BPQL
Surrogate % Recovery	96%	94%	107%	101%	95%	90%	97%	95%	95%	95%

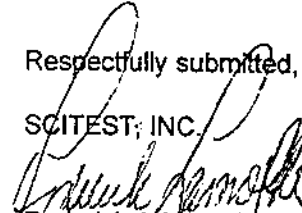
EPA Method 8020

BPQL = Below Practical Quantitation Limit, 1 ppb

c: Hoffer & Associates

Respectfully submitted,

SCITEST, INC.


Roderick J. Lamothe
Laboratory Director

GROUNDWATER SAMPLING DATA SHEET

LOCATION: BERLIN MOBIL SHORT STOP
DATE: MARCH 7, 1995

SAMPLE METHOD: 2" + 1.5" BAILERS
SAMPLING TEAM: TF SCHMALZ

Page 1 of 1[illegible]

* (1.5" = 0.092 gals/ft, 2" = 0.16 gals/ft, 4" = 0.65 gals/ft, 6" = 1.5 gals/ft)

REMARKS *- LABELED MW-02, H₂O LEV. TAKEN USING INT. PROBE

6... TO: (ARI) REPORT
 J.B. COLLINS, INC.
 54 LOWER WELDEN ST.
 ST ALB VT 05478

COPY RESULT TO: HOFFER + ASSOCIATES

Scitest, Inc.				LABORATORY NUMBER:	
P.O. Box 339					
Route 66 Professional Center, Randolph, VT 05060				Berlin Mobil	
Phone: (802)728-6313 Fax: (802)728-6044				LOGIN:	
Client: Jeff Hoffer		Project #	70249	Address: P.O. Box 428	
Contact:		Phone No:		Waterbury, VT 05676	
Date requested:	03/03/95	Requested by:	KED	Cals Checked by:	
Date shipped:	03/03/95	Cooler #(s)		Date:	
Date scheduled:	03/06 or 07/95			Report Prepared by:	
				Date:	
CHAIN OF CUSTODY		DATE	TIME	Additional Comments:	
SAMPLED BY: T. Quinn		3/8/95	1340	PLEASE SEE ABOVE.	
RELINQUISHED BY: [Signature]		3/8/95	1340		
RECVD BY SCITES INC: [Signature]		3/8/95	1:40pm		
				Data Tran Checked by:	
				Date:	

Item Nos	Client ID or Description	Sampling Date/Time	Type Comp/Grab	Matrix	Preserve/ Label	Preserve Check	Bottle Type	Reqd. Volume	Bottles/ Sample	ASAP	Parameters and Holding Times			
											24 hrs	48 hrs	7days	>7days
1	MW-01	3/8/95 1105		GW			VOA	40 mL	2					EPA 8020
2	MW-06	1120		GW			VOA	40 mL	2					EPA 8020
3	MW-03	1135		GW			VOA	40 mL	2					EPA 8020
4	MW-05	1150		GW			VOA	40 mL	2					EPA 8020
5	CU-01	1155		GW			VOA	40 mL	2					EPA 8020
6	MW-04	1215		GW			VOA	40 mL	2	(1)				EPA 8020
7	MW-02	1230		GW			VOA	40 mL	2					EPA 8020
8	MW-10A	1240		GW			VOA	40 mL	2					EPA 8020
9	FB-01	1245		GW			VOA	40 mL	2					EPA 8020
10				GW			VOA	40 mL	2					EPA 8020
11	Trip Blank	0900 (3/8/95)		DIW	TB		VOA	40 mL	2					EPA 8020

w/requests